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BACK TROUBLES. A REVIEW OF THE PRESENT SITUATION FROM A SERIES OF HOSPITAL CASES; AND A DISCUSSION OF MUSCULO-LIGAMENTOUS CAUSES.

By Herman W. Marshall, M.D., Boston.

The amassing of quantities of clinical observations and methods pertaining to back troubles continues with medical progress. And specialists succeed in relieving patients now through their accurate knowledge of special details, who otherwise would continue to have backaches.

Confusion also grows simultaneously in degree and extent with unwieldy accumulations of medical data relating to backs; so also many patients fail to have their troubles relieved promptly now because they are treated by special methods of extremely limited ranges of efficiency.

Medical progress accordingly should be recognized as one distinct thing and the welfare of patients may be quite a different one, especially immediate welfares of those suffering at the present time.

For while carefully planned and executed scientific clinical studies help medical progress and presumably will be of benefit to patients sometime in the remote future, yet they diminish the chances of patients now for successful care when they mainly add to existing widespread confusion.

It would be much better for those who are sick now, perhaps, if all original scientific investigation could be stopped awhile, and all investigators set at work sorting over and rearranging facts that have collected, but which remain poorly understood. Then, on completion of repeated sortings and fittings together of numberless isolated facts into natural groups, according to well-known physiologic and anatomic principles, through impartial critical studies, presumably more correct complete diagnoses and more efficient rational treatments would occur more generally.

The group of present-day sufferers is far too large and too important a one to be neglected as it is; also while advantages of scientific medical research upon the majority of small topics remains so doubtful under the existing conditions.

It is interesting to observe that the bulk of knowledge at present represents an accumulation of numberless scientific studies on definite, easily managed special topics, as the latter have been followed carefully in their various ramifications and bearings.

Original investigators naturally are anxious to show how great the clinical importance of their selected subjects can be; and rarely do they dwell with equal enthusiasm on the insignificance, under other conditions, of features they have been working on. Yet both views are indispensable for fair estimates of average normal values. Therefore, when the overwhelming predominance of one-sided extreme clinical studies is considered there can be little wonder that they obscure effectually the usual significance of various factors which enter into complicated back troubles.

Another point which should be noted is the matter of group diagnoses and treatments. These have been tried recently to improve chances of present patients, and in a limited number of instances desirable breadths of view have thus been combined with unusual accuracy of special details. Undoubtedly some results have been better than those attained by single physicians.

In fairness, however, it must be admitted that combined defects of groups of extreme specialists outweigh advantages of these combinations very frequently; and that in consequence very many patients are worse off than if they adhered to one medical adviser.

Again, it is interesting to compare other very simple and very elaborate methods of treatment, as, for illustration, the abbreviated ones which accident insurance companies employ with injured workmen, in contrast to extensive diversified therapeutic procedures carried on by large scientifically conducted hospitals. It will be seen there are benefits and dangers in simplicity, as well as possibilities of unnecessary care and too much attention paid occasionally to outpatients' back complaints in hospitals.

The writer's conclusions from the foregoing set of facts are that steps in medical progress of greatest importance immediately for patients are impartial critical reviews of already collected facts and data. Rearrangements of masses of unclassified, apparently contradictory, clinical observations are absolutely necessary before adequate working theories are obtained that will explain satisfactorily many individual peculiarities that come to notice, or allow most intelligent satisfactory treatments.

Accordingly a series of hospital cases has been selected to assist in an impartial critical review of some of the features and peculiarities of the present stage of understanding and care of troubles of the back.

Diversified matters discussed in this paper will be taken up under the following main headings: (A) Theoretical Considerations; (B) Practical Results of Having Correct Theoretical Conceptions; (C) Musculo-ligamentous Back Troubles and Comparisons with Other Back Conditions; (D) An Analysis of a Series of One Hundred Hospital Cases of Back Troubles.

(A) THEORETICAL CONSIDERATIONS.

Postural Variations in Spines and Anatomic Variations in Vertebrae—Backaches are recognized as being due very often to these two underlying causes. The first relates to slightly variable relationships among groups of bones in vertebral columns; and the second deals with developmental peculiarities of bones of one person as compared with corresponding ones in other individuals; but peculiarities of muscles and ligaments enter with equal clinical importance, although not mentioned in these anatomical terms, in each instance of postural spinal peculiarity or anatomic vertebral variation.

After acceptance of these two causes for backaches, observers feel an involuntary surprise when many striking cases of vertebral variations or postural peculiarities are encountered with no abnormal symptoms at all. A natural tendency then arises to discount the importance of anatomic features and to conclude hastily that they mean very little or nothing.

Casual observers haven't time to study out the fact, that it is the *physiological balance* always between bones and their musculo-ligamentous supports, which determines development or non-development of pathological manifestations; and that it is never safe to base judgments on anatomic peculiarities alone no matter how great they are.

True relationships can be summarized correctly as follows from careful inspection of many available peculiarities and existing conditions: All anatomic variations of vertebrae possess no practical significance whatever as long as their physiologic stays remain adequate, and many persons presumably go through life carrying anatomic anomalies with practically no trouble at all. Bony peculiarities, nevertheless, always remain latent menaces which are liable to assume pathological importance at any time the flexible supports sufficiently weaken and stretch.

Postural variations in spines may mean very much or practically nothing. Their presence proves that at some past time muscles and ligaments have stretched, if these variations do not represent congenital ones; but they do not indicate in any way of themselves whether subsequent increments of musculo-ligamentous strengths have, or have not, compensated perfectly for changes in postures. They do not indicate whether ligamentous stretchings which produced them were slow, continuous, or interrupted; whether recent rates of ligamentous weakening have become rapid suddenly, or whether there have been no recent changes at all. It is impossible to estimate strengths of backs safely from variations of postures alone; and postural peculiarities, like vertebral anomalies, possess no practical significance worthy of consideration as long as supporting muscles and ligaments are adequate for their tasks. The *physiologic balance* between degrees of postural variations and strengths of flexible physiologic back supports furnishes the only reliable index of functional efficiency of different postures.

Hypertrophic Arthritis of the Spine—Hypertrophic or osteo-arthritis of the spine represents the sum of all transient mechanical stresses and strains; and all different vascular influences acting on it which shift from time to time. It is the record on the bones, particularly around joints and ligamentous attachments, of these combined influences in the individual's past life. It includes effects of various past infections, mild and severe; metabolic vascular peculiarities and variations from time to time; all mechanical injuries as well as ordinary pressures and strains which bones are subjected to more or less continuously. It is not a specific trouble.

If one physician chooses to emphasize only some particular infection of the past or present time, at least no one can disprove very convincingly the possibility of his contentions. The same holds true for enthusiasts who are convinced of the great importance of past or present metabolic disturbances, or effects of unknown internal secretions. Physicians with strong leanings toward mechanical origins for hypertrophic changes can always point confidently to continuous strains sustained as a part of active life, and to innumerable traumata of greater or less severity.

However, it is impossible to pick out any long period in any active person's existence when his joints, bones, muscles and ligaments are not being subjected simultaneously to various mechanical strains, to various infectious influences, as are indicated by constant presence of excreted bacterial products in the urine and to various metabolic products circulating in the blood, derived from vital activities within the person's own tissues. Always, therefore, should hypertrophic arthritis be considered the total sum of a large number of mixed causes and never purely a specific disease.

Sometimes an unusually lively bacterial infection produces acute joint inflammations and is designated as infectious arthritis, that is, if the person is young. But if it happens to come late in life, after accumulated bony changes have become appreciable, then probably it will be termed hypertrophic arthritis, although the underlying cause remains of the same nature as the earlier attack of infectious arthritis in youth. At least the diagnosis of infectious arthritis is found practically to be made seldom in the aged.

A condition of affairs similar to the one existing between infectious arthritis and hypertrophic arthritis also is observed between musculo-ligamentous strains and hypertrophic arthritis. Diagnoses are likely to be "back strains" until hypertrophic changes are seen; then the latter obscure the former, although musculo-ligamentous weaknesses continue to be main causes for pathological symptoms. In hypertrophic arthritis, as with postural variations in spines or anatomic variations in vertebrae, structural bony features, which are easily recognized, obscure other equally important but more difficultly understood causes.

Thoughtful consideration of available data on this subject leads to the following conclusions:

"Hypertrophic arthritis" is an overworked term which means little or much according to the manner bony overgrowths have developed.

It is never safe to estimate the importance of any condition from existing degrees of bony overgrowths alone; for serious disability may continue with only slight bony changes; and surprising recoveries of normal functions are compatible with extensive bony hypertrophies.

Hypertrophic arthritis represents the *result* of many previously acting causes usually more than it indicates the underlying *cause* of present pathological back symptoms.

A physiologic balance is maintained between vital processes going on within bones and outside influences, namely, those exerted on bony structures through mechanical activity and injuries, vascular and nervous channels.

Hypertrophic changes help to show with what degree of success bones have maintained their normal functions and appearances through past difficulties. It is true they roughly suggest probable future rates of change; but such osseous hypertrophies can never be relied on very completely, however, as indicators, since outside acting influences sometimes are abruptly changed, thereby altering, favorably or unfavorably, vital processes within bones, together with future hypertrophies and future functional efficiencies.

Bony hypertrophies, aside from the actual mechanical limitations they cause occasionally in joint motions, or their rare pressure effects on nerves, mean practically nothing themselves as long as other factors in the physiologic balance continue favorable in the future for bones and ligaments.

Limitations of Nomenclatures Used in Diagnosis of Back Lesions—Diagnoses are very commonly made correctly, but they refer often to such small special features that they do not have much significance. To illustrate this point one hundred records from a very large series of back cases were selected. Diagnoses from hospital records showed hypertrophic arthritis in thirty-three cases; infectious arthritis in thirty-four cases; back strains in thirty-three cases. These hundred records were looked through carefully by the writer for occurrences of variations in vertebrae of sufficient magnitude to be mentioned in x-ray findings; and for definite traumata associated with onsets of back symptoms.

Enthusiasts might re-classify these hundred cases in other ways. Nineteen might be considered "traumatic back troubles." Fourteen might be thought of as "vertebral anomalies"; and most of them could be designated as "mixed" lesions. "Mixed" is an undesirable word, however, and it seems better to adhere to descriptive anatomical or physiological terms.

It is correct to speak of a person with slouching attitude, drooped shoulders and hollow or twisted back as an illustration of faulty posture. This is the anatomical conception. Equally correct in many instances is the term "musculo-ligamentous relaxation" of the back, which lays emphasis on strengths and stretchings of physiological supports of the spine.

Hospital Diagnoses

One hundred back cases showed the following facts:

- Thirty-three Hypertrophic Arthritis of the Spine
  - 14 cases had to be diagnosed from clinical appearances without x-rays.
  - 19 cases had x-rays taken sometime during their course of hospital visits. These showed the following results:
    - 19 x-rays
      - 6 were negative for hypertrophic changes.
      - 13 were positive for hypertrophic changes.
      - 5 showed vertebral variations.
      - 1 showed metastatic new growth of vertebrae.
      - 1 showed beginning tuberculosis of spine.
      - 1 showed a probable fracture of a vertebra.
  - 8 cases were associated with traumata at onset of symptoms.
  - 8 cases were considered back strains also, at some time during their course. No diagnosis of infectious arthritis was made, although numerous foci were present. Forty-nine years was the average age of these 33 patients.
- Thirty-four Infectious Arthritis of the Spine
  - 21 cases were diagnosed from clinical histories, without x-rays.
  - 13 cases had x-rays taken which showed the following results:
    - 13 x-rays
      - 6 showed positive hypertrophic bony changes.
      - 3 showed vertebral variations.
      - 3 showed obscure bony lesions.
  - 4 cases were considered to represent back strains also, at some time during their course.
  - 2 cases were associated with traumata at onset of symptoms. Thirty-three years was the average age of these 34 patients.
- Thirty-three Back Strains
  - 24 cases were diagnosed from clinical histories without x-rays.
  - 9 cases had x-rays taken which showed the following results:
    - 9 x-rays
      - 1 showed definite hypertrophic bony changes.
      - 6 showed vertebral variations.
      - 1 suggested spinal tuberculosis.
      - 1 suggested a fracture of a vertebra.
  - 9 cases were associated with definite traumata at onset.
  - 9 cases had foci of infection which justified a diagnosis of infectious arthritis. Thirty-three years was the average age.

If, in turn, causes of musculo-ligamentous relaxations are searched for in the blood which supplies back tissues, then peculiarities may be spoken of in terms of vascular variations. In some instances it may be possible to go further, and to designate more remote causes for harmful vascular combinations or peculiarities. Perhaps some abnormality of the gastro-enteric tract has permitted entrance into circulation of unusual substances or unusual quantities of normal vascular constituents which influence musculo-ligamentous back tissues. Or, possibly, kidneys have failed to remove such circulating substances, allowing them to accumulate and produce their effects.

Musculo-ligamentous tissues in other instances are influenced apparently through the blood by parasitic bacteria or their circulating toxins, attention being called to the infectious nature of the process or to the location of the remote focus. Many organs and symptom-complexes may be loosely connected, more or less remotely, thus with the back through the vascular system and reflex nervous mechanisms.

Mention should be made in passing of the clinical grouping of cancer, cachexia and back pain; other forms of anemia, with rheumatic aches and back weaknesses; specific complaints like nephrolithiasis or constipation and back symptoms; pregnancies, irregularities of menstruation, retroflexions of uteri and other pelvic disorders. Neurologists look upon certain instances of back trouble as due to instability or unusual responsiveness of nervous tissues in psychoneuroses.

The writer would suggest the use, therefore, of as broad comprehensive terms as possible in designating back troubles, now that so many clinical terms have developed. And it is important to realize that because one name is right as far as it goes, another name for the same condition is not necessarily wrong.

All usual aims would be served, if, in the hundred instances which have been cited, a simple classification of "musculo-ligamentous back troubles" were adopted; and greater precision obtained, when desired, by additional clauses. For example, "relaxed" or "irritative" musculo-ligamentous back lesions; or "relaxed musculo-ligamentous back trouble associated with constipation and marked postural defect"; or "irritative musculo-ligamentous back trouble with vertebral variation, hypertrophic bony changes and nephrolithiasis"; or "relaxed musculo-ligamentous back changes with simple, mild debility."

Limitations of Clinical Examinations—Examinations sometimes are called thorough because they represent a great amount of labor, and because they are so in comparison with ones made in the past. Yet some of our so-called thorough examinations are inadequate for accurate testing of many conditions, as, for example, changing strengths of sacro-iliac ligaments and slight displacements of sacro-iliac joints.

It would be convenient if strengths of sacro-iliac ligaments could be measured directly, in order that comparisons might be made between different joints, or in the same joint from time to time. Much clearer ideas would become possible if irregularities of sacro-iliac joint surfaces, together with variations in their sizes and shapes, could be estimated.

With these data available, it might become easier to judge how serious any given sacro-iliac strain was apt to be from degrees of ligamentous weakness shown, and the likelihood of slipping, as indicated by surface irregularities and outlines of joints; for some joints require greater stretchings of ligaments than others to allow unlocking of opposed elevations and depressions on their slightly uneven surfaces.

It would add greatly to precision, also, if vascular variations could be measured from time to time that are causes of ligamentous changes from time to time; but, unfortunately, there are no available clinical methods suitable for routine use in determining amounts of all the numerous circulating vascular constituents; nor for identifying circulating bacterial toxins which are assumed to act on the joints.

Our ideas on these matters now have to be obtained indirectly with very considerable inconvenience and effort. And, undoubtedly, it is owing to these circumstances that sacro-iliac displacements are still topics for discussion; and that relationships between lesions of internal organs and backs, as well as relationships between mild debilities without demonstrable pathological lesions of internal organs and backs, remain in dispute. Many doctors cannot, or will not, take time and trouble to puzzle out sacro-iliac peculiarities from data at hand; and they are the ones who are the disbelievers.

It is not possible to go into details at much length here concerning the evidence for mild debilities being causes of transient weaknesses of back, muscles and ligaments. Often the only clues consist of a few ordinary complaints and physical signs, namely, loss of appetite, recent slight losses in weight, nervous fatigue or worry and mental irritability, slight muscular weaknesses and relaxations, and slight secondary anemias.

Strictly scientific physicians state that it is dangerous to build the science of medicine and medical progress on such flimsy clinical foundations as these; and they state the truth. Nevertheless, patients, who are sick now, often can be very considerably benefited if their physicians will only attempt to understand how nervous fatigue can start a train of symptoms. If nervous fatigue is maintained long enough it can upset digestive and excretory functions temporarily, cause transient accumulations of waste products or other substances in circulation, produce mild anemias and temporary musculo-ligamentous relaxations, and go so far as to induce backaches. Such physicians then can have the satisfaction of relieving many of their debilitated patients quickly by prescriptions of rest, diet regulations and tonic-eliminative drugs, the latter given in accordance with well-established physiological and pharmacological principles. And it does not seem that these successful medical practices will seriously retard medical progress in the future.

For those who do not yet understand sacro-iliac joint slippings, or who disbelieve in them, the following explanations are intended.

Figure 1 shows photographs of a number of anatomical specimens; and, as the pictures were taken under the same conditions by the writer, all being made with the camera at the same distance from the objects, the different sizes, shapes, and surface irregularities of sacro-iliac joints are strictly comparable. Outlines of articulating surfaces have been made clearer by dotted lines; but original shrivelled cartilaginous joint surfaces can be seen still with cartilages in their actual positions. Obviously, different degrees of resistance in slipping of joints would be offered by these various forms and surfaces.

Confusion that arises about displacements comes mainly from the fact that no laxity of ligaments can ever be demonstrated in the majority of instances; consequently, casual observers declare slippings rarely take place. Their ideas only are a little careless and rough, for they imagine too gross and readily recognized lesions.

What actually takes place probably is as follows: Some patients engaged in lifting feel something give out suddenly in lower parts of their backs, and immediately, without thinking, they relieve the strains upon their backs.

Strains are severe enough to tax ligaments nearly to limits of their normal inelastic strengths, and finally these limits are exceeded for the weakest ligaments. The latter really stretch an extremely slight amount before they rupture; and the moment they begin to lengthen, a tendency of joint surfaces to slip increases until actual displacements occur. Such dislocations are extremely minute, however, as a rule, because strains on backs are instantaneously relieved. The weakened sacro-iliac ligaments are able to contract again and continue to hold

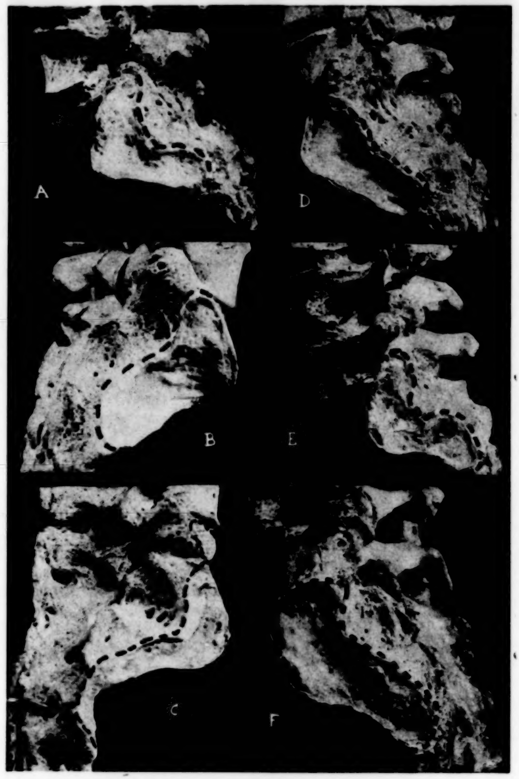

Fig. 1.

joint surfaces immovably in their new relationships. Further displacements of such joints, which have slipped, are possible only by repeated new strains of sufficient severity to overbalance again the limits of ligamentous inelasticity. Ligaments, although weakened, are still very strong, so there are no outward changes appreciable after minor dislocations.

Extremely heavy lifting or sudden twistings are necessary to produce displacements of sacro-iliac joints in robust, healthy men; but if an individual happens to remain quiet, and his back muscles and ligaments weaken steadily through vascular defects from debility or autointoxications, then only a moderate or possibly a slight mechanical strain is required to produce displacements.

Weakenings of ligaments from vascular causes may go so far not infrequently that back symptoms develop without appreciable traumata, simply from strains sustained in supporting the weight of the body. Severities of back injuries therefore, are not very satisfactory indicators alone of the probable courses which resultant back troubles will take. Always it is necessary to take into consideration, as far as blood tests and general examination permit, the quality of circulating blood and its defects.

These illustrations serve to show how attempts have to be made to circumvent limitations of clinical methods, and how that failures in understanding can be traced sometimes to limitations of human patience and perseverance. Further considerations of musculo-ligamentous peculiarities have to be deferred until they are mentioned in the section on musculo-ligamentous back troubles.

(B) PRACTICAL RESULTS OF HAVING CORRECT THEORETICAL CONCEPTIONS.

Orthopedic belts, braces, jackets and exercises, then, will not be applied indiscriminately to every case of vertebral anomaly or postural variation. It will be realized that new back strains may be brought on by therapeutic meddlings when physiological balances between bones and their musculo-ligamentous supports already are in favorable states of equilibrium; or at any rate, that treatments are unnecessary under these conditions.

Operations on long transverse processes of fifth lumbar vertebrae will not be attempted without recalling that surgery does not remove underlying causes for ligamentous weaknesses. Such vertebral processes have no significance as long as ligamentous stays do not stretch and allow them to impinge on adjoining bones; therefore, there will be hesitation in still further weakening flexible supports of bones through additional injuries unavoidably sustained in surgical measures.

Vascular peculiarities responsible for temporary weakenings of muscles and ligaments will not be neglected in treatment, as so often happens now when mechanical features absorb nearly all attention.

Patients with hypertrophic arthritis of the spine will not be given discouraging, hopeless diagnoses because extensive bony overgrowths are shown in x-rays. They will be examined and treated rationally to reduce future unfavorable influences acting; and possibilities of permanent subsidence of severe painful symptoms will be recognized, even with well-advanced hypertrophic changes, when some important cause for the latter can be removed.

Generally, there will be better balanced ideas regarding physiologic alternations of exercise and protection; dangers of too much care or too great neglect; comparative merits of different forms of apparatus, and numerous small details which can be discussed better in the analysis of the series of hospital cases.

Briefly summarized, the practical result of securing correct theoretical conceptions constitutes one of the first important steps towards gaining efficiency in treatments that rightly can be expected now. Then perhaps there will cease to be so much confounding of wealth of medical data, which is great, with skill in directing treatments which still is decidedly poor in very many instances. We have very little reason now to pride ourselves on our ability to care for back troubles properly, when there are so poor general agreements as to a practical working hypothesis, and when so many inefficient one-sided methods of limited scope still are used so widely without adequate general conceptions.

(c) SPECIAL MUSCULO-LIGAMENTOUS PECULIARITIES AND TESTS. OTHER LESIONS OF THE SPINE.

All simple postural strains, traumatic strains, torn ligaments, myositis, toxic or mixed infectious back lesions, synovitis, so-called typhoid spines, hypertrophic arthritis and spinal bony anomalies will be grouped in a single comprehensive class of musculo-ligamentous back troubles. This is advisable because differentiations are so difficult or impossible often; also because several of the list commonly occur simultaneously; and because musculo-ligamentous features always are very prominent in all, while other special peculiarities possess more limited significances.

However, there remain to be mentioned spinal fractures and dislocations, tuberculosis of the spine, vertebral neoplasms, spinal cord tumors and nervous disorders which have such well-defined natures that their important specific sides overshadow other features, including musculo-ligamentous ones.

It seems appropriate, accordingly, to discuss certain characteristics of ligaments and muscles and afterwards the other mentioned topics in turn.

Special Ligamentous Peculiarities—Use and disuse produce opposite effects on tissues, including muscles, ligaments and bones. With use muscles swell in size and increase in strength, bones exhibit rearrangements of their internal structures to compensate for increased strains, and ligaments hypertrophy to meet their increased physiologic requirements. With disuse muscles shrink and become less strong, bones show rarefying processes in their structures, and ligaments slowly weaken.

Ligamentous changes are most difficult to prove, especially small, slow variations from time to time, as has been pointed out with regard to sacro-iliac joints. But there are no uncertainties about great changes, namely, the ligamentous stretchings and weaknesses which occur in serious joint destructions like tabetic knee joints. Lesser changes presumably take place in milder troubles in similar ways although recognized with difficulty.

Ruptures of ligaments leave them with frayed, ragged ends. In more gradual changes entire masses of ligamentous fibers elongate, or fibers slip among themselves dislocating previous relationships; but it is impossible practically to show what really does take place in any individual case.

The chemical reactions of cloth fibers are useful in assisting comprehensions of the changes taking place in ligamentous strengths. Different pieces of the same textile fabric which have been treated in different ways with chemicals or dye-stuffs show variations in strengths subsequently as a result of particular kinds of treatments they receive. Possibly all look the same after chemical processes as before, yet on testing them some are found to remain strong while others are "rotted" more or less.

It is of interest that connective tissues, including ligaments, outside of the body react in characteristic ways to acids and alkalies, swelling and shrinking according to chemical reactions of the medium in which they are immersed. On a commercial scale these connective tissue peculiarities are witnessed in "plumping" processes associated with preparation of leather.

From these comparisons, it is not difficult to imagine how living ligamentous tissues can be influenced in chemical or physical ways by variable compositions of blood and lymph to which they are subjected. They do not change much in outward appearances, but presumably some transitory vascular conditions are more favorable than others for their strength. Some unfavorable blood conditions, for example, those of auto-intoxications and debilities, apparently produce transitory weaknesses analogous to "rottings" of textile fibers; but with the difference that strengths are slowly regained again after objectionable vascular defects pass away.

Finally, as signs of diminishing vitality, can be observed beginnings of uratic deposits or calcifications in and upon ligaments, at their points of insertions where mechanical strains and injuries have been greatest.

Clinical Tests for Muscles and Ligaments—The practical dilemma in which we find ourselves at present consists of our inability to measure accurately the principal functions of muscles and ligaments, namely, their strengths, by any routine clinical method. Nor can we measure clinically now those unknown vascular peculiarities in patients which are producing changes of musculo-ligamentous strengths from time to time. Even our estimates of the severity of traumata experienced are comparatively crude. How then can it be expected that physiologic efficiencies of backs can be judged with great precision; that exact states of physiologic balance, from time to time, in different individuals, between bony peculiarities of their spines and their flexible spinal supports, can be determined when strengths of the latter are so imperfectly known?

The answer is that at present accurate ideas are not possible, and that this state of affairs must remain until new clinical tests are devised for measuring muscular and ligamentous strengths; and until new clinical blood tests also are discovered by which identifications and easy measurements of innumerable quantitative vascular peculiarities become possible. Meanwhile, by indirect means, we must continue to gather clues of musculo-ligamentous peculiarities in whatever ways now are available.

Sizes of muscles offer an opportunity to gauge roughly their extremes of weakness and strength. Peculiarities of postures, when not due to developmental variations, draw attention to possibilities of musculo-ligamentous stretchings of the past, from which individual histories of such patients' past troubles indicate whether existing postures mean very little or very much. The occupation, and history of injuries, indicate roughly how much any particular person's ligaments and muscles have had to resist. Distribution of back pains roughly suggests what particular group of muscles or ligaments has been strained. Tenderness upon pressure is an extremely important symptom in the localization of back lesions; and there may be diffuse tenderness throughout irritated muscle masses at times, or sharply localized tenderness at other times over ligaments and ligamentous attachments.

X-rays reveal spinal anomalies, but alone they furnish no clues whatever as to whether such bony variations are to be considered factors of weakness or strength or how they influence ligamentous variations. It is from histories of these patients, together with evidences of local trouble, as revealed by local sensitiveness to pressure, that x-rays become valuable in diagnosis of musculo-ligamentous lesions.

Further information of a certain kind regarding back muscles can be gained from local spasm of muscles as they respond to irritations; while limitations in normal ranges of back motions are indicative of back defects of some sort. Simple blood tests reveal anemias and possible relationships with back weaknesses. From this vascular point of view, extending to various organs of the body, are loosely traced probable or improbable relationships.

The list of indirect clinical tests for backs thus can be enlarged indefinitely, each adding its bit to the evidence relating to musculo-ligamentous strengths and their variabilities from time to time. But each is likely to be very limited in its scope, and, therefore, is never to be given much weight except in a very small proportion of all cases.

Fairly good estimates of strengths of backs can be secured from testing individuals' back lifting powers; yet, of course, weights lifted show as much regarding the integrity of the bony spine as they do concerning its flexible stays. Some ideas are obtained concerning the efficiencies of both. The writer makes use of a rough weight lifting test, which can be made easily and quickly with a self-registering dynamometer, that occasionally indicates interesting differences. Patients simply are directed to lift as hard as possible on the dynamometer, and are cautioned to desist as soon as they begin to feel uncomfortable pain or weakness. This gives an idea of the strength of muscles, ligaments, and bones taken all together as a single unit which can be recorded in pounds. Two illustrative cases will indicate what differences may be found.

A stevedore came with complaint of pain situated low in the back, of gradual onset, without trauma. There was more than the average lumbar antero-posterior curve. Pains were moderate and diffused in sacral and lower lumbar regions. Localized tenderness was absent. Back motions were cautiously made and slightly restricted. Back muscles stood out as prominent, firm ridges on each side of the deep median furrow of the back.

The second patient also was a middle-aged man with very prominent lumbar muscles, with restricted back motions, and a history of a fall a year previously.

When the first one lifted on the dynamometer it registered three hundred pounds, while the second patient could pull only ten pounds before pain and weakness were felt uncomfortably. An x-ray of the second case showed an old impacted fracture of the first lumbar vertebra. Further examinations revealed in the first man the fact that all muscles were prominent and well developed, and that subcutaneous fat was very scanty. He had a mild musculo-ligamentous back strain, but also had development of an athlete with hard, prominent, yet not contracted, muscles of the back. The second man was trying unconsciously to protect his injured spine by reflex muscle spasm.

Electrical tests have been devised for strained back muscles, and although not commonly used, they do help in favorable instances to show undoubted functional muscular differences.

An apparatus which the writer uses consists of a series of condensers, plates of mica coated on both sides with tin foil and all embedded conveniently in paraffin, so that an electric current can be passed into the system according to the need, and from one to nineteen of the various sized plates utilized. When the current enters the connected tin foil discs on one side of the mica plates there is induced a momentary current in the independent system of discs insulated by the mica on the opposite sides of the plates. This quantity of electricity, which is momentarily induced by making and breaking of the primary electrical circuit, is led away to muscles where it may cause visible muscular contractions around a stimulating electrode placed on any selected spot, provided enough units have been thrown into the series to furnish sufficient electricity.

The advantages of the apparatus are that it provides variable definite quantities of electricity measured in a reliable, easily regulated manner. Extremely minute doses (0.01 microfarad) are tried first experimentally, and increased in regular way, until muscular contractions just begin to occur in response to stimuli. Smallest quantities required to cause visible contractions are used as end points in readings and these amounts are recorded.

With an electrical myometer of this sort, striking differences are found at times between relaxed erector spinae muscles of the two sides in the lumbar region, that correspond with unilateral distributions of pain. Increased sensitiveness to electrical stimuli is found in some instances in gluteal muscles as well as lumbar regions, showing that we must not narrow down our conception of back strain too closely. When spinal muscles are contracted reflexly around some irritated spinal segment larger doses of electricity are required to obtain direct contractions in these tense muscles than in relaxed ones. Nervous, apprehensive patients respond with reflex muscular contractions occasionally as soon as the first sub-minimal dose is tried, then as the amount is increased there appears the usual small visible contraction around the stimulating electrode, followed quickly by the second reflex contraction of the whole muscle. When the electrode is brought into the neighborhood of an irritated sacro-iliac joint there may be a feeling of nausea produced, with no muscular contraction.

The apparatus is used by taking repeated readings because, similarly as in estimating the presence or absence of knee reflexes, it is necessary that slight variations in positions are tried before correct estimates are secured.

There are many limitations to the application of the myometer, and many patients show no differences which can be depended on, nevertheless, it is useful in directing attention away from bony peculiarities that have to be managed somehow just as they exist, to musculo-ligamentous changes that can be rectified and which should be treated by every reasonable available means as quickly as possible in order to prevent development of chronic weaknesses.

In concluding the discussion of musculo-ligamentous back troubles mention has to be made to referred back pains. Some physicians claim back pains represent referred nervous phenomena originating from demonstrable lesions of internal organs. Others are equally certain that such backaches can be traced to definite abdominal or pelvic lesions, perhaps, but that conditions essentially represent harmful variations of the blood which produce musculo-ligamentous relaxations or irritations in the back.

Neither theory can ever be proved or disproved conclusively because both possibilities always simultaneously exist, neither one can be excluded in any given instance, both are plausible, and perhaps both are correct at times; but there the matter must rest at present. So let us admit our limitations instead of unwisely engaging in useless controversies.

Fractures and fracture-dislocations of vertebrae. Fractures and fracture-dislocations of the spine, of special interest in connection with back troubles here under consideration, are not obvious fractures accompanied by grave spinal cord lesions, but obscure impactions of vertebral bodies, or fractures of transverse processes of vertebrae, without spinal cord injuries and without usual signs of fractures. These can be diagnosed positively only by means of x-rays, so that many of them have been diagnosed in the past as chronic severe cases of musculo-ligamentous back injuries.

The topic of fractures and fracture-dislocations will not be entered into in detail; but one instructive unusual case that was examined by the writer for the Massachusetts Industrial Accident Board will be cited and x-rays given to illustrate some of the possibilities which have to be thought of.

A fifty-three-year-old man fell 18 feet from a staging and landed on his buttocks in a sitting posture with his back bent forward. He went home almost immediately after the accident on an electric car, and within a few days an x-ray was taken which showed no definite bony spinal lesion. He was given a combination steel back brace and abdominal-pelvic belt and after one year's time he was examined by the writer. At this later time the back brace was being worn, and there was a very slight prominence at the fourth lumbar vertebral spinous process. Back motions were limited greatly. He could not bring a hod of coal upstairs on account of the feeling of back weakness. Pains in the gluteal region, of which he had constantly complained, were subsiding but were still quite severe. No pains were present in the legs; knee-jerks were equal and very lively; tenderness was localized and severe at the lumbo-sacral juncture. Additional x-rays were thought advisable and were taken by Dr. Arial George of Boston. They revealed a fracture-dislocation of the fifth lumbar vertebra on the sacrum. In the lateral view, which is given below, and which was taken through the pelvic bones, can be seen a surprising degree of forward dislocation of the fifth lumbar vertebra which could not be identified in any way from antero-posterior plates usually taken.

Tuberculosis of the Spine. Typical tubercular lesions of the spine with extensive destructions of vertebrae and with visible bony knuckles or deformities are omitted from consideration, because they are well understood. There are some cases of spinal tuberculosis in adults, however, which remain latent for long periods before appreciable x-ray changes are observed in bones, or before bony deformities become evident.

These patients inevitably receive diagnoses of infectious arthritis, back strain, or hypertrophic arthritis until x-rays show true natures of the lesions. It is not uncommon to have some tubercular patients come for treatment with histories of gradually developing back pains, with or without injuries, and to have back muscles only slightly rigid with motions limited in only moderate degrees.

In these patients painful symptoms not infrequently subside slowly and completely with protection; and then the patients disappear for six months or a year or more. They have tubercular infections apparently of such low grades of virulence that alternate periods of back pain and freedom from pain may occur for years before x-rays finally demonstrate definite and often quite extensive tubercular bone disease without deformity.

One practical lesson from these perfectly reliable clinical facts is, that all suspected sacro-iliac displacements should have the precaution taken of having x-rays made always before forcible manipulations are attempted.

Other causes for back symptoms. Neoplasms of vertebrae have to be mentioned which are

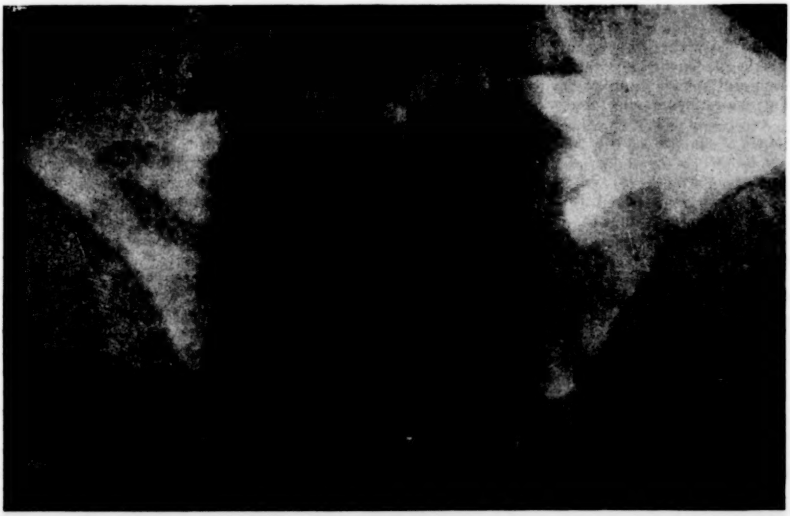

FIG. 2.—Fracture-dislocation of fifth lumbar vertebra on sacrum. (Dorso-ventral view.)

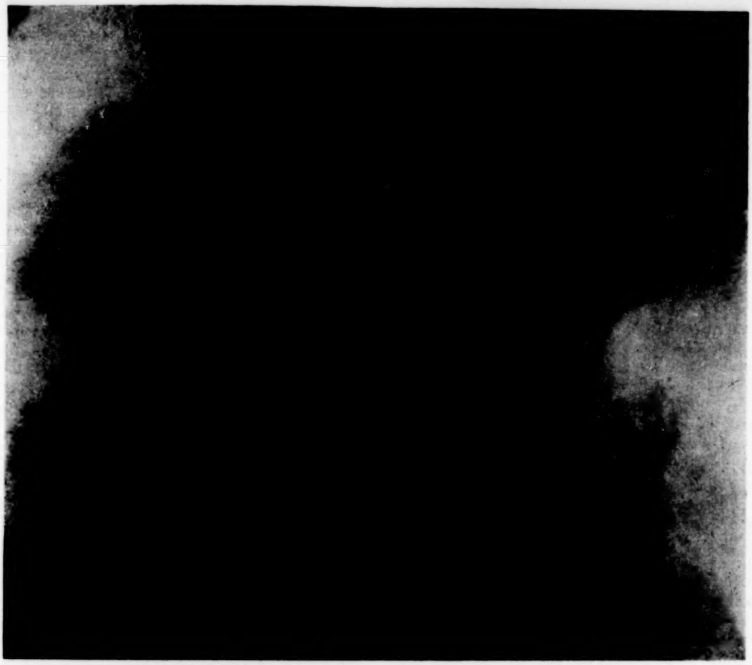

FIG. 3.—Fracture-dislocation of the fifth lumbar vertebra on the sacrum. (Lateral view taken through the pelvis.)

secondary to new growths in the body elsewhere; and histories of the latter help to fix suspicion on the probable character of back pains in these patients, yet x-rays are needed to make diagnoses positively.

Primary bony new growths, sarcomata of the spine, are encountered not very infrequently, and like tubercular lesions, they await x-ray differentiations for positive proof usually of their existence. Commonly, they are diagnosed sacro-iliac strains, infectious arthritis, or hypertrophic arthritic changes until detectable bony changes settle their characters.

Spinal cord tumors, particularly new growths of coverings of caudae equinae, produce low back symptoms. All cases with bilateral pains that extend into both legs should be carefully investigated. One such patient which the writer saw in the practice of another physician died very suddenly without any very obvious cause for death and the autopsy showed a glioma of the cauda equina. The patient presented the usual clinical appearance of a severe sacro-iliac lesion aside from bilateral leg pains. There have been instances of relief from operations with removal of these tumors in those cases in which diagnoses have been made.

Syringomyelia is associated with irregular back pains that are mistaken occasionally for musculo-ligamentous back strains, but as soon as this trouble has developed enough to show its characteristic features then differential diagnoses become possible.

Finally, must be mentioned, for completeness, rare cases of abdominal aneurysms which erode the spine and cause severe back symptoms. Localized arteriosclerotic changes of arteries of spinal cord and spinal ganglia also are said to be causes of very severe back pains; and it seems more reasonable to the writer to explain some back symptoms in this manner than to imagine nerves are pinched in vertebral foramina. Hemorrhages into cord coverings and caudal neuritis have to be included in the list of causes of low back pains.

(D) AN ANALYSIS OF A SERIES OF ONE HUNDRED HOSPITAL BACK CASES.

Hospital records of thirty-three hypertrophic arthritis, thirty-four infectious arthritis, and thirty-three back strain cases, mentioned already while discussing limitations of diagnoses, will be reported further here in a single group.

Twenty-nine of the hundred cases came either once or twice, mainly for diagnoses or x-rays.

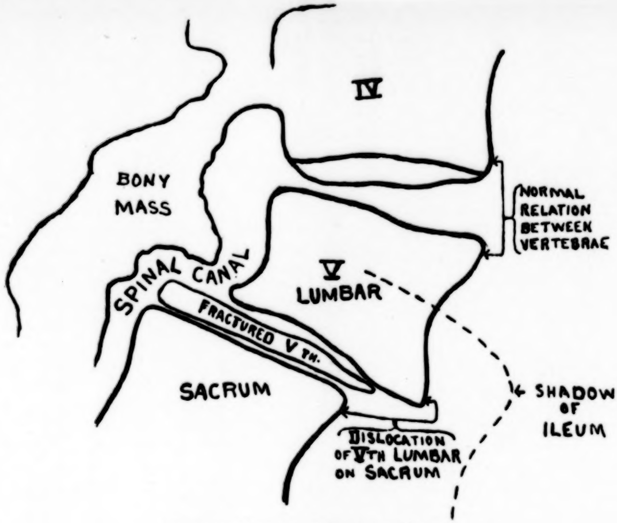
IV
BONY MASS
SPINAL CANAL
V LUMBAR
FRACTURED V TH.
SACRUM
NORMAL RELATION BETWEEN VERTEBRAE
SHADOW OF ILEUM
DISLOCATION OF VTH LUMBAR ON SACRUM

FIG. 4.—Tracing of bones in Fig. 3.

Sixty-four of the hundred cases completed their treatments and disappeared in a year or less, coming to the hospital from two to twenty-four times, averaging six or seven visits before they were lost to observation.

Seven of the hundred cases required one year or more of treatment, owing to recurrences of back symptoms. The longest time was two years and two months, and even then relief was not obtained.

Average durations of treatments among the majority of cases of back strains and infectious arthritis were six or seven weeks. In the hypertrophic group of older patients, ten to eleven weeks of treatment were required, on the average, by most of them.

Among these hundred patients twenty plaster jackets were put on; twenty-four webbing belts fitted; adhesive strappings were applied to forty-four patients; leather jackets or steel braces given to seven persons; medico-mechanical exercises prescribed in ten instances; hydrotherapeutic treatments taken by eighteen patients; and twenty-nine patients received drugs of various kinds. Seventy-two of the hundred were examined in more than one department of the hospital. Ten had their teeth examined by x-rays for infectious foci, and seven of the ten showed negative results.

Plaster jackets were put on within a few days after patients first made their appearances, in fifteen of twenty cases. The remaining five were deferred until moderately severe symptoms failed to respond to adhesive strappings.

The usual indications for plaster casts were x-ray appearances that looked suspiciously like early tubercular spinal lesions; or very acute pains with marked muscular rigidity.

Duration of wearing jackets varied from nine days to ten months, depending upon different circumstances.

Splitting of jackets often occurred after two or three weeks' wear, then patients continued to wear them split for variable lengths of times, according to individual requirements, while belts were being made.

Results of wearing of jackets. Two patients experienced extreme relief immediately. The majority of patients were relieved more slowly. One patient claimed that no relief was obtained, one said the jacket made his pains worse, and one never returned after the first visit at which the jacket was immediately put on. One, which subsequently proved to be malignant disease of the sacrum, was relieved greatly for nine weeks previous to his disappearance from hospital observation.

Results of adhesive strappings. They caused great relief promptly in one to seven days among six patients of the forty-four which were strapped. The majority were improved more slowly. No relief was obtained in eight cases, and one patient stated that strappings increased back pains. The most satisfactory result occurred with complete relief in twelve days from two strappings in an acute, moderately severe, type of back strain. Webbing belts very commonly were substituted for strappings, if the latter failed to relieve pains completely after a few weeks.

Results of webbing belts. They were ordered after adhesive straps, or for patients whose severer symptoms had been partly relieved by plaster jackets. They were worn very variable lengths of times, patients commonly ceasing to return to the hospital as soon as they received their belts, while symptoms were subsiding.

Leather jackets and steel braces were prescribed seven times for chronic troubles and faulty postures. They duplicated in convenient forms many of the effective features of plaster casts. They usually are worn for considerable periods.

Hydrotherapeutic baths, given to eighteen patients, were prescribed immediately in seven instances, one to nine baths in twenty-five days or less. Usually when they were combined with tonic-eliminative drugs in early cases there followed prompt relief of backaches except in one case of associated kidney stone. Ten of eighteen cases were prescribed after plaster casts had partially relieved the pains, or after Zander exercises had been tried, or webbing belts were producing only fair progress. Four or five bath treatments generally were taken on the average; but one patient received thirty-eight in one year and five months.

Results of hydrotherapeutic baths. Prompt relief followed in several cases, and all patients were more or less improved for a while, at least, also no unpleasant effects were observed.

Medico-mechanical exercises were given almost always late in courses of treatments, after belts and jackets had partly relieved pains at the expense of increasing stiffness. From one to twenty-seven treatments were received in times ranging down from three months as the maximum. The majority of the ten patients took only three or four on the average. No bad results were reported and usually patients were partially limbered up again.

Medicines were given in medical departments of the hospital to eight patients for special complaints. Aspirin or sodium salicylate was prescribed to eight other patients. Mild tonic-eliminative drug combinations were given in the orthopedic department to twenty-one patients in order to rectify obscure vascular conditions, and thus accelerate restorations of musculo-ligamentous strengths.

Interpretations of Statistics; Criticisms; General Conclusions—Statistics presented by these hundred cases indicate that enough was done for them, and that a sufficiently varied set of therapeutic measures was employed. Fair degrees of skill, at least, are shown by absence of poor results in most cases; and exact degrees of skill never can be estimated closely from statistical data.

Matters of very vital importance from standpoints of patients' welfares at the present time, however, are these variable degrees of dexterity which are shown in prescribing therapeutic agents and courses.

Many learned scientific medical men allow their interest to cease to a great extent when transition lines between medical science and the art of medical practice are reached. On the other hand, unlearned practitioners of various sorts often study closely their patients' comforts. By adopting certain reliable methods originated by careful scientific physicians, non-scientific men may acquire skill greater sometimes in treating patients than doctors of much greater scientific training, who neglect this final step in successful medical care. For not infrequently patients state that, after trying all kinds, they have received most benefit from certain doctors whose reputations are not the best because of the irrational, fantastic theories they hold. Yet, undoubtedly, certain patients really are relieved by unconsciously skillful practices of these questionable individuals who do not understand why they succeed and who offer entirely wrong explanations for benefits received.

This state of affairs should not exist to the extent it does; and there should be as much care taken with patients' welfares by the best mentally equipped medical men as there is great interest shown in medical science, even though art in practice does consist of understanding and applying innumerable, comparatively uninteresting details of familiar methods and remedies.

Complete, perfect, theoretical conceptions of back troubles avail little practically, when there is not adequate knowledge of such exact details, as, for example, the time to take off a plaster jacket that has been put on, or if adhesive plasters cannot be applied in a way to reinforce weakened back muscles and ligaments. The weakest link in the chain of procedures determines the strength of the whole system of links.

It is an unfortunate fact that a considerable percentage of practitioners still do not know much about these very simple matters. There are thousands of belts and braces hung loosely on patients now, which are not doing their intended work. Medicines are prescribed still in routine manner very often with greater regard to over-dosage than to securing their desired physiologic effects. Strappings are applied many times without much thought of anatomy, or muscular arrangements, nor of limitations of strengths of straps.

The writer believes that plaster jackets are left on usually too long in cases of musculo-ligamentous strains, and that stiffness from long immobilization retards recoveries very frequently. Four or five days is a sufficient time to give strained or irritated tissues a chance to be relieved appreciably. Then, jackets should be split, and afterwards reapplied, if necessary, a part or whole of the time. Splitting also allows applications of firm adhesive strappings under them, or combinations with massage and hydrotherapy. Wearings of jackets resemble wearings of plaster casts after fractures; both may be extremely desirable, yet both are liable to result in extremely undesirable stiffness if not discontinued soon enough.

Too scanty local protection, on the other hand, is observed rather commonly among industrial accident cases. Insurance companies find that drawbacks of too much protection in the majority of cases are greater than risks from minimum amounts of medical care. They encourage injured workmen to use their backs as soon and as much as possible. And some of the latter have delayed recoveries from too much activity when backs are weak.

Combinations of adhesive strappings with tonic-eliminative drugs give very satisfactory results in cases of average severity and of average duration. They are better than either one alone. Drugs and diet regulations, in combination with plaster casts, likewise are beneficial; and, in fact, very few patients' conditions are so purely mechanical that they will not be improved more or less by measures that improve qualities of circulating blood. Yet, very commonly patients are treated as though they are only defective mechanical machines.

Manipulations of sacro-iliac joints happen not to have been made in any of this series of cases; nevertheless, manipulations occasionally are extremely beneficial. They sometimes terminate in a few minutes pains that have lasted for months, and some patients are so greatly relieved after moderately forcible manoeuvers that they beg to have them repeated. Care has to be exercised, however, with forcible manipulations not to aggravate latent tuberculosis which is simulating sacro-iliac troubles, or not to increase existing strains of sacro-iliac ligaments, as may readily happen when patients are etherized. Since it is impossible to detect slight slippings of sacro-iliac joints, manipulations have to be made rather blindly, attempting to force joints back into their original position by pressures and pulls in directions opposite from the ones which have produced displacements.

Patients who have felt something "give way" in their backs can be manipulated gently very soon. Those who are not making satisfactory progress at the end of two months also should be gently stretched and pulled without anesthesia. Long-standing, severe cases occasionally obtain prompt relief from the continuous pull of extension weights attached to the leg while patients lie in bed.

All variations in combinations and variations in lengths of administrations of different therapeutic measures cannot be discussed in this paper, although upon them depend shortenings or prolongations in times of recoveries.

Enough has been said, however, to show that unsatisfactory states of affairs now can be traced often to utterly inadequate theoretical conceptions or to inadequate, bungling treatments. There is a justifiable optimistic view possible from contemplating the very great achievements of medical science recently, yet, in fairness, a balance has to be struck, with some pessimistic consideration of the vastness of our present failures. An opinion is thus reached that progress in care of back cases is being slowly made, and that there are tremendous opportunities for improvements with the facts and tools at hand, depending simply on greater carefulness, thoughtfulness and skill.

In conclusion, the writer wishes to acknowledge his indebtedness to Dr. E. G. Brackett of Boston, for many privileges at the Massachusetts General Hospital; and to Dr. F. D. Donoghue, medical adviser to the Massachusetts Industrial Accident Board, for numerous suggestions on phases of the subject not generally considered.

LITHIASIS WITH BILATERAL RENAL INVOLVEMENT.*

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WHEN lithiasis is found to exist with bilateral renal involvement, certain problems of diagnosis, prognosis and treatment arise which merit special consideration. The various conditions in which such involvement is present may be as follows:

1. Bilateral nephrolithiasis, including stone in the ureter on one or both sides.
2. Lithiasis in one kidney and disease in the other.
3. Lithiasis in a solitary kidney.
4. Lithiasis in a fused kidney.

Bilateral Nephrolithiasis.—On reviewing the records of the Mayo Clinic from Jan. 1, 1910, to Oct. 1, 1917, it was found that 62 patients had been operated on for bilateral nephrolithiasis. During the same time, 504 patients with unilateral lithiasis were operated on, making a percentage of 12.3 of bilateral lithiasis occurring in the operative cases. It is, however, difficult to determine the exact proportion in which bilateral nephrolithiasis occurs because of the many associated factors. It would be necessary to include, (1) all cases of bilateral nephrolithiasis and ureterolithiasis, which for various reasons were not operated on, (2) cases of ureteral stones on the opposite side previously removed by operation and cystoscopic manipulation, since they are in fact dislodged renal stones, and (3) all stones passed spontaneously from one or both kidneys and ureters.

General Statistics.—In the series of 62 patients operated on, there were 40 males and 22 females, which is in keeping with the relative occurrence of sex as noted in cases of unilateral lithiasis. It is of interest that lithiasis should occur practically twice as often in the male as in the female. This relative proportion also holds good in other forms of chronic renal infection, and is suggestive of the infectious etiology of the condition. The average age of the patients was forty years, and the average duration of symptoms was nine years. It is unfortunate that the symptoms associated with lithiasis should be allowed to remain without treatment during so long a period. Their long duration is in a large measure responsible for the comparatively poor prognosis and the various complications so frequently seen with bilateral lithiasis.

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* Presented before the New England Branch of the American Urological Association, Boston, November 15, 1917.

Localization of Pain.—The pain was localized definitely to both sides in only 14 cases, to one side in 26 cases, and in 14 cases to one side recently with a previous history of more or less definite pain on the other side. Renal pain was absent in 8 cases. The large number in which the pain was entirely or predominating on one side (64.51 per cent.) should emphasize the necessity of making a complete roentgenographic exposure of the kidneys and ureters on both sides in every case. In cases in which the pain was absent, attention was called to the possibility of nephrolithiasis by the presence of microscopic pus in the urine. In the majority of instances the kidney causing the most pain, particularly in recent years, was found at operation to be the better of the two. The kidney which in former years had caused most of the pain, with little or no pain recently, was, in the majority of instances largely destroyed, and a nephrectomy was necessary.

Location of Stones.—The location of the stones in cases in which both sides were operated on was: pelvis and calices, bilateral, 10; pelvis and calices on one side and cortex on the other, 7; pelvis and calices on one side (nephrectomy on the other), 9. When one side only was operated on the stones were found located as follows: pelvis and calices, 14; cortex, 6. There were 7 nephrectomies and 2 negative explorations. No attempt was made to localize the stones in the cases of pyonephrosis with stones, since the destruction of the kidney-tissue was so great that it was impossible to determine their exact situation. It is evident that in cases of bilateral nephrolithiasis the majority of stones are situated in the pelvis and calices, as in cases of unilateral stones. Literature on the subject would lead us to believe that stones are most commonly situated in the cortex with bilateral lithiasis, but judging from our series, such localization is less frequent. Many cortical stones described as such in the operation records were probably situated originally at the end of the calices.

Estimation of Renal Function.—Estimation of the combined renal function may, in a few cases, be of considerable aid to prognosis. Phenolsulphonephthalein is, for all practical purposes, as valuable as any functional test. When the return in two hours is only a trace or persistently very low, the prognosis is necessarily grave, and operation is usually not advisable unless there are urgent indications. We have, however, observed two patients in whom there was a persistent low phenolsulphonephthalein output, 5 and 8 per cent. respectively, several years after operation. When the phenolsulphonephthalein return is moderately low, varying from 20 per cent. to 40 per cent., I have frequently observed that it will later become much higher following operation. This is particularly true in the presence of marked infection relieved by drainage subsequent to lithotomy, and it may be inferred that toxic absorption as well as reflex irritation may be the cause of temporarily reducing the renal activity. A high return, 50 per cent. or more, is of value when clinical symptoms, or the general appearance of the patient, are suggestive of renal insufficiency. Particularly is this true in the presence of marked renal infection with toxic absorption, which frequently causes symptoms simulating advanced renal insufficiency. A high phenolsulphonephthalein return would assure the existence of one good kidney at least. The combined functional test, therefore, is of practical value only with a normal or extremely low return where the clinical appearance is doubtful.

It may be desirable to determine the comparative degree of function remaining in the two kidneys. This is not always possible but frequently may be done, (1) by the size and character of the stone, (2) by cystoscopic inspection, and (3) by a differential functional test.

Radiographic Data.—Very large stones, and more particularly large branched stones will, as a rule, cause so much tissue-destruction that nephrectomy will be necessary. Occasionally, however, the amount of secreting-tissue remaining is surprising in spite of the existence of large branched stones. The difficulties in removing such stones entirely, particularly when soft and crumbling, without too much damage to the kidney-tissue, are considerable. Single round stones, even though of large size, may cause comparatively little damage to the kidney-substance, and usually offer a better prognosis. Multiple stones, particularly when of large size and scattered throughout the kidney, usually indicate complete destruction of the kidney.

Cystoscopic Inspection.—Such inspection may be sufficient to determine the comparative functional ability. If thick pus is seen exuding occasionally, or only on pressure, the destruction of the kidney may be taken as very evident and ureteral catheterization will be unnecessary. When, however, the urine on one or both sides is clear or only moderately cloudy, a differential functional test may be of some value. As I have previously stated, pyelography may give more accurate data as to the extent of renal destruction than any other method. When the pelvis and calices are seen to be markedly dilated and irregular, it may be inferred that comparatively little healthy tissue remains. Pyelography should, however, be employed only when other methods fail, and then only when a comparative estimate of renal function is of practical value.

Differential Functional Test.—The irritation caused by stone in the kidney will usually interfere greatly with the accuracy of the estimate of renal function. It is difficult to explain the variable degree of reflex inhibition of secretion exerted by renal stone. One kidney containing a stone may have a phenolsulphonephthalein return of but 4 or 5 per cent. in fifteen minutes, while another, with a stone similar in size and position and with the same degree of infection, may have a normal return. As a rule, small stones of recent origin and without marked infection, will cause comparatively little functional disturbance. Low functional return in the presence of stone is usually succeeded by a normal phenolsulphonephthalein output after the stone has been removed. Renal functional tests can give us only an estimate of the functional activity of the kidney at the time of the examination, and not what the kidney is capable of doing under normal conditions. Too much reliance cannot, therefore, be placed on the amount of normal tissue in the kidney, as shown by the phenolsulphonephthalein test. This was well illustrated in one of our recent cases with stone in the left renal pelvis in which the differential phenolsulphonephthalein estimate from the left kidney was 7 per cent. in fifteen minutes. From this it might be inferred that considerable healthy tissue remained and a conservative operation would be indicated. At operation, however, a large abscess was found in one pole, together with several soft areas in other portions, so that a nephrectomy was clearly necessary. In several other instances in which branched stones were present the phenolsulphonephthalein return was surprisingly good, and on surgical exploration the kidney was found to be so markedly diseased in areas that a nephrectomy was obviously indicated. On the other hand, if the phenolsulphonephthalein return is zero or only a trace, it may usually be inferred that the kidney is so largely destroyed that a nephrectomy is indicated. If, however, the phenolsulphonephthalein test is only comparatively low, the functional test is of uncertain value, and unless the other data obtained by physical, cystoscopic or roentgenoscopic examination are of definite value, surgical exploration only will determine whether or not the kidney can be saved.

INDICATIONS FOR OPERATION.

After it has been decided that an operation is advisable the question arises: Which of the two kidneys should be operated on first? Rules as follows may be made:

1. In the presence of recent acute pain, repeated and continuous hemorrhage or toxic absorption from advanced renal infection referred to one kidney, that kidney must necessarily be operated on first.

2. If conditions do not necessitate this operation, the kidney with the better function should be operated on first in order to take advantage of the function remaining in the kidney on the other side during the acute stages following operation. This is particularly imperative when the stone is so situated that the drainage from the kidney with the better function may be obstructed. When the irritation, infection and danger of obstruction have been removed by the lithotomy, the other kidney may be operated on and removed if it seems advisable.

3. In cases in which the patient is in excellent physical condition, and the stones are of moderate size and advantageously situated, the renal function only slightly reduced and but little or no infection present, both stones may be removed at the same time.

PATIENTS NOT OPERATED ON.

There were 33 cases in which a very evident diagnosis of bilateral nephrolithiasis was made, and the patients were not operated on. No operation was advised, for various reasons, in 21 cases, and in 9, operation was advised but the patients did not return. Two patients were operated on for coincident malignancy in other parts of the body, and in one case the patient is awaiting operation.

Of the patients regarded as inoperable the predominating symptoms in nine were those of renal insufficiency. The history of pain was either entirely absent or of secondary importance. Our attention was called to the possibility of renal lithiasis by the presence of pus in the urine. It was found necessary to make a roentgenogram in every case in which there was pus in the urine, even if there had been no history of pain. While this necessitated a large number of negative x-ray exposures, nevertheless the frequency with which lithiasis was thus discovered made the procedure worth while. The renal insufficiency is usually the result of long-standing infection. Of particular interest is the fact that five patients in this group complained primarily of gastric symptoms which were frequently the only subjective evidence of renal insufficiency to be noted. The clinical data of renal insufficiency differ from those usually observed with the ordinary type of nephritis, in that there is no increase in blood-pressure, and little or no evidence of other circulatory disturbance. In practically every case the phenolsulphonephthalein output was markedly reduced, and in four instances the estimate was either zero or a faint trace. The stone was exceptionally large in the majority of instances, which explains the absence of acute pain, since large stones seldom obstruct urinary drainage.

In five other patients, although there was more or less clinical evidence of disturbance of renal function, the predominating symptom was that caused by marked secondary infection. Purulent urine was secreted by both kidneys and the symptoms were marked by frequent attacks of chills and fever. In three of these cases there were multiple stones of variable size, and it was evident that their removal would be followed by considerable destruction of the kidney-tissue. It is this form of bilateral nephrolithiasis which offers the poorest prognosis following operation. One of the patients with multiple large stones was allowed to return home, and three years later was reported to be in fair health. Had she been operated on and the stone removed, it is a question whether she would have lived as long. In the other two patients the stones were small and evidently secondary to well-advanced pyelonephritis, the symptoms being due to renal insufficiency as well as to infection in one; the other was markedly benefited by pelvic lavage, but because of the absence of acute symptoms, operation has been deferred.

Two patients had bilateral hydronephrosis, complicated with stones; a point of unusual interest, in that the stones were very evidently of secondary formation in a primary hydronephrosis. The stones were small and round and could scarcely be the etiologic factor of the urinary obstruction; they were evidently secondary deposits in the alkaline residual urine. Neither of these patients had secondary complication to warrant immediate operation, and when last heard from they were in fair health.

In two instances the stone was discovered accidentally. One patient complained of gastric symptoms only, and was operated on for acute duodenal ulcer. The other had symptoms of marked circulatory disturbance and hypertension. Operation was not done in the case of one patient because the degree of cardiac insufficiency made it inadvisable. One patient was discovered to be pregnant at the time of examination, and operation was deferred until after pregnancy terminated. The patient had previously gone through an uncomplicated pregnancy without symptoms of nephrolithiasis and it seemed advisable to allow the pregnancy to progress.

Two patients had been previously advised of stones in both kidneys, but they had not had symptoms of any kind in recent years. There was little or no evidence of infection in the urine and the renal function was but slightly impaired. Because of the previous history and evident tolerance of these patients, it did not seem best to remove the stones. In the presence of large or multiple stones which are not causing acute pain, suppuration or hemorrhage, the advisability of operation is questionable. The patient acquires a tolerance to the stones and will often have a better prognosis than if they are removed. If the stones are small and the function is not too greatly diminished, operation may be advisable in spite of the fact that there are no acute symptoms. If, however, there is considerable kidney-destruction, the removal of large stones causes so much damage to the kidney-tissue that death frequently results soon after operation. The possibility of stones recurring and then being situated so as to cause urinary obstruction, must also be considered.

Stone-Forming Kidneys.— A considerable group of patients, with pain referred to both kidneys, have been examined who gave a history of having passed stones repeatedly, but who at the time of examination were found to be negative. Several of these patients had passed a stone within a week or so following thorough examination, including repeated roentgenography, cystoscopy, and pyelography. With a definite history of colic referred to the kidney, in spite of negative roentgenographic and cystoscopic data, a negative diagnosis of lithiasis should be made with caution. The inability of the x-ray to show this type of stone would lead us to believe that the occurrence of bilateral lithiasis is more frequent than can be ascertained by our present methods of diagnosis. The tendency to repeated stone-formation on the part of the kidney is most interesting. That it may be due to some disturbance in metabolism is suggested by the frequency with which the formation ceases after the diet has been corrected. Several of the patients with bilateral nephrolithiasis gave a history of having passed stones. In the presence of large or multiple stones it is probable that the stones passed spontaneously have been either single stones from a group or portions of single large stones.

PATIENTS OPERATED ON.

Both kidneys were operated on in 33 patients and one only in 29 patients. Seven of the 29 patients were advised to have both kidneys operated on but they refused. In the remaining cases, either the stone was so small that it was believed that it would be passed spontaneously, or the condition of the patient did not permit of operation. Five of this group passed the stone from the other side spontaneously. The destruction of renal tissue consequent to the search and removal of very small stones is so great, that it is usually best to await further developments, providing the patient can be kept under observation. When it is found advisable to remove such stones, pyelography has proved of great aid in their identification and localization.

Nephrectomy.—In 22 patients a nephrectomy of one kidney was found advisable because of the advanced destruction of the organ. In 7 of these patients a nephrectomy alone was made; in 15 it was found necessary to do either a pelviolithotomy or nephrolithotomy on the other kidney.

POSTOPERATIVE RESULTS.

There was no operative mortality, which would indicate that patients with bilateral nephrolithiasis, when properly selected, offer no greater operative risk than with unilateral lithiasis. There were ten deaths reported subsequent to operation, all within less than a year, the majority presenting clinical evidence of renal insufficiency.

SUBSEQUENT EXAMINATION.

Twenty patients were examined at varying times following operation, and recurrences were found in 5. In correspondence with other patients, 3 gave a history of having passed stones from the kidney operated on, and 4 gave a history of severe pain, which we regarded as probably due to recurrence, thus making the total number of recurrences 12 (19.35 per cent.). A previous review of patients with unilateral lithiasis showed a total recurrence of less than 10 per cent. It is evident, therefore, that the recurrence in bilateral nephrolithiasis is fully twice as great as with unilateral lithiasis.

In the 22 cases in which it was found necessary to do a nephrectomy because of calcareous pyonephrosis, six patients died within a year following operation. The prognosis, therefore, in cases of advanced calcareous pyonephrosis on one side is very grave. Subsequent examinations were made in 5 of these patients, recurrence being noted in but 1. Later, letters were received from 3 patients, all of whom appear to be fairly well.

UNILATERAL LITHIASIS WITH DISEASE IN THE OPPOSITE KIDNEY.

There were fifteen cases of stone in one kidney and disease in the other. This group does not include a large number of cases in which an occasional pus-cell was found in the catheterized specimen from the opposite kidney. A few pus-cells are easily picked up by the ureteral catheter from the bladder-fluid and should have no practical significance, provided other cystoscopic data are negative, and the function of the kidney is found to be normal. But with definite evidence of infection and disturbance in function in the other kidney, the question may arise whether or not operation would be advisable.

Among the various conditions found in the opposite kidney, pyelonephritis to a moderate degree was found in 6 cases, pyonephrosis to such an extent that the kidney was functionless in 5, hydronephrosis in 3 and tumor in 1.

PYELONEPHRITIS IN THE OPPOSITE KIDNEY.

In the presence of pyelonephritis in the other kidney, it is advisable to ascertain as nearly as possible, its functional activity. When the functional test is normal the infection may disappear spontaneously following nephrectomy. When the function is moderately low it is advisable to institute pelvic lavage and catheter drainage, preliminary to operation. Uncomplicated pyelonephritis is usually painless. There was no pain referred to the kidney with pyelonephritis except in one instance, and the patient gave a subsequent history of having passed a small stone, with colic referred to the kidney where a pyelonephritis only had been previously diagnosed. When, therefore, a pyelonephritis on the opposite side is accompanied with pain even though the roentgenographic evidence is negative, we must suspect the possibility of stone lodged either in the ureter or kidney, and an exploration may be justifiable. Stone secondary to a chronic pyelonephritis is not a rare complication to renal infection, and was found in two of our patients. Removal of the stone, however, does not necessarily effect improvement in the pyelonephritis.

In two patients the nephritic element predominated and the infectious process seemed to be of secondary importance. The stone was removed from the cortex or end of the calyx, and it was hoped that its removal would improve the renal function. While both the patients made a good temporary recovery, on subsequent correspondence and examination no definite change was noted in the condition.

One patient had a peculiar anomaly in that he had a reduplication of both ureters and pelves. The stone was situated in the upper pelvis of the left kidney which was independent from the lower pelvis. The stone was removed by bisection of the kidney. Pyelonephritis remained in the lower pelvis and was also present in both pelves on the right side. The patient was recently examined (six years after operation) and was found in a fair degree of health in spite of the persisting pyelonephritis which seemed to be no further advanced since the previous examination.

Inflammatory destruction of the kidney containing stone was so advanced that nephrectomy was necessary in three cases; the pyelonephritic kidney was left to carry on the function. Subsequent data from two other patients lead us to believe that they are in a fair state of health. Whether or not the increased function in the remaining kidney had any therapeutic effect would be difficult to determine.

PYONEPHROSIS IN OPPOSITE KIDNEY.

With pyonephrosis in the second kidney the indications for operation may be confusing: (1) When the function of both kidneys is greatly destroyed and there are no acute complications, the condition is not operable. (2) When there is even a small amount of normal tissue remaining in the calcareous kidney and there are acute symptoms which require relief, nephrolithotomy and drainage of the infected areas are indicated; the pyonephrosis in the opposite kidney being left undisturbed. (3) When the renal stone is not causing any acute disturbance and there is either pain or evidence of systemic infection from the opposite kidney, immediate nephrectomy of the latter is indicated. In this series there were a number in the first group, which have been previously referred to; there were 2 in the second group and 3 in the third group. The prognosis in the first two groups is necessarily very poor, all patients being reported dead within a few months after operation. In the third group there is usually a marked improvement in the condition of the patient. This is usually accompanied by improvement in the function of the remaining kidney even though stone is present. In one patient, the combined function rose from 19 per cent. before operation to 40 per cent. a month after operation. The predominating symptoms in 3 of the patients were on the side in which the stone was located and in 2 patients on the side of the pyonephrosis. The discovery of stone in the latter was accidental.

HYDRONEPHROSIS IN THE OPPOSITE KIDNEY.

There were 3 patients with hydronephrosis in the opposite kidney and in 2 of these the hydronephrosis was bilateral with secondary formation of stones. From the long duration of symptoms, extending back to childhood, it would seem as though the hydronephrosis were of congenital origin, although unilateral hydronephrosis of recent origin with secondary stones is not an uncommon condition. In one patient the stones had caused so much infection that the kidney was largely destroyed and a nephrectomy was necessary. The patient, however, died three months after leaving the Clinic. In another case a pelviolithotomy was done and the patient reports some improvement with persistence of pain in both kidneys. The third patient was not operated on and reports the passage of numerous small stones and the cessation of symptoms a short time after being dismissed. It is evident, therefore, that in the presence of complicating hydronephrosis a conservative operation is indicated when possible.

TUMOR IN OPPOSITE KIDNEY.

In one patient a tumor was found involving the opposite kidney, which proved to be sarcoma. A nephrectomy was done but was only partially successful since there was infiltration in the surrounding tissues. No further operation seemed advisable.

STONE IN A SINGLE KIDNEY.

In 7 patients, with only one kidney, a stone was removed. In 5 of these nephrectomy had been done elsewhere some time previously; in the other 2 there was no evidence of the existence of the opposite kidney, and there was no clinical evidence of previous renal disease, so it may be inferred that the condition was congenital solitary kidney. In 3 of the 5 cases in which a nephrectomy had been done, this was necessary because of pyonephrosis—in 1 because of hydronephrosis, and in 1 because of acute pyelonephritis. The operations performed on the single kidney were nephrolithotomy 3, and pelviolithotomy 4. In one of the cases of nephrolithotomy the patient was operated on three times for recurring stone, extending over a period of six years. The patient died seven years after the first operation. One other patient was also operated on for repeated stone, but is now alive and well. This illustrates the great degree of tolerance which a single kidney may have for removal of recurring stone. One patient developed uremia one month after operation and died. One patient had a subsequent x-ray examination, which was negative; there were no subsequent data in the remaining three cases.

A peculiarity noted in several of the cases was the high phenolsulphonephthalein output of more than 50 per cent., in spite of the presence of a stone of considerable size in the kidney. Had the opposite kidney been functionating, the output would have been considerably lowered by the presence of the stone, and the other kidney would have been performing a correspondingly larger amount of work. In the absence of the opposite kidney, however, the entire function was forced upon the one, and the stone-irritation did not have the usual effect. There was no operative mortality in this group. Two of the patients have since been reported dead. The others are living, and to all appearances are in comparatively good health.

HORSESHOE OR FUSED KIDNEY.

Five patients were operated on when lithiasis was found in a fused or horseshoe kidney—in 4 the lithiasis was confined to one-half of the kidney, and in 1 there was a stone in both sides of the kidney. In 2 patients with unilateral involvement, secondary infection had advanced so far that bisection of the kidney was necessary. In 2 a pelviolithotomy was performed. In the case of bilateral nephrolithiasis, heminephrectomy was necessary on one side, and a stone was removed from the lower ureter by cystoscopic manipulation on the other. Three of these patients are alive from one to five years after operation.

SUMMARY.

1. In 17.2 per cent. of the patients in this series there was bilateral renal involvement. The percentage of bilateral lithiasis was 12.3.
2. Bilateral as well as unilateral lithiasis occurred twice as often in the male as in the female.
3. Pain in bilateral nephrolithiasis was unilateral in 64 per cent and absent in 8 per cent of the cases.
4. Bilateral stones were found most frequently in the pelves and calices.
5. Combined renal functional tests were of practical value only when normal or extremely low.
6. To ascertain the comparative degree of

function in the two kidneys, the functional test was of value only when it was zero or a trace, normal or excessive.

7. The functional test, x-ray examination and cystoscopic inspection may be insufficient in determining the degree of healthy renal tissue remaining, and exploration only can determine this.
8. Indications for operation: (a) The kidney with acute complications should be operated on first; (b) without acute complications the kidney with the better function should be operated on first; (c) occasionally simultaneous bilateral operation is advisable.
9. Patients may be inoperable because of renal insufficiency, secondary infection, kidney destruction or constitutional complications.
10. Patients with large bilateral stones causing no symptoms or complications are better off without operation.
11. The operative mortality in this series was zero; the total number of deaths after operation 10; these patients died less than a year following operation. The operative mortality with calcareous pyonephrosis is much greater than with other forms of bilateral lithiasis.
12. The recurrences in cases of bilateral nephrolithiasis was 20 per cent; in unilateral lithiasis, as previously reported, it was 10 per cent.
13. When there is stone in one kidney the most common forms of disease in the opposite kidney are: Pyelonephritis, pyonephrosis and hydronephrosis.
14. With unilateral lithiasis the opposite kidney may be so badly diseased that a preliminary operation may be advisable on that kidney.
15. Stone secondary to pyelonephritis, when removed, prevents further renal destruction but is not of curative value.
16. When the nephritic element predominates, removal of the stone is not of much therapeutic value.
17. A single kidney has a great degree of tolerance for repeated operation for stone.
18. In a single kidney the phenolsulphonephthalein output usually remains high in spite of the presence of an uncomplicated stone which is probably due to compensatory hypertrophy.
19. Fused or horseshoe kidneys permit of repeated operation for lithiasis which may, if necessary, include hemi-nephrectomy.

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Clinical Department.

FRACTURE OF THE NECK OF THE FEMUR: REPORT OF THREE CASES.

By Charles E. Ayers, M.D., Worcester, Mass.

These three cases, occurring in people past middle age, and treated by the Whitman abduction and fixation method with such satisfactory end-result in one, and anatomical reposition of fragments in all three, shown by x-ray, leads me to report them. All three were seen shortly after the accident, and showed the typical picture of fracture of the neck of the femur, with eversion. The method used for reduction is the method described by Whitman, as follows: Patient, having been anesthetized, is placed upon the back, the head and shoulders supported by a box of sufficient size, pelvis resting on a sacral support. The disabled member is first flexed to disengage folds of capsule that may have fallen between the fragments. It is then extended and rotated inward to the normal attitude, and under traction and counter-traction the shortening is completely overcome, as demonstrated by measurements. The sound limb is then abducted to the limit to demonstrate the normal individual range and to fix the pelvis. The limb on the injured side is then slowly abducted by the assistant, while the surgeon, supporting the joint, pushes the thigh upward from beneath, to force the two fragments against the anterior part of the capsule. When the limit of abduction has been reached the capsule will be tense, thus directing the fragments, now in a horizontal plane and end to end, toward one another, and finally forcing the contact. The fracture is as if it were locked by internal splinters, and it is only necessary to hold the limb in the attitude of complete abduction and complete hyperextension by a plaster spica.

Case 1. Mr. A., aged 64 years. Occupation, stone-cutter. Oct. 25, 1916. In the evening, while coming home from work, the patient started to cross street and was struck by a news team and knocked down, striking on right hip. He was brought home and seen shortly afterwards.

Physical Examination.—Well developed and fairly nourished man, past middle age, very nervous, showing some evidence of shock. Heart action soft and slightly irregular. Right leg

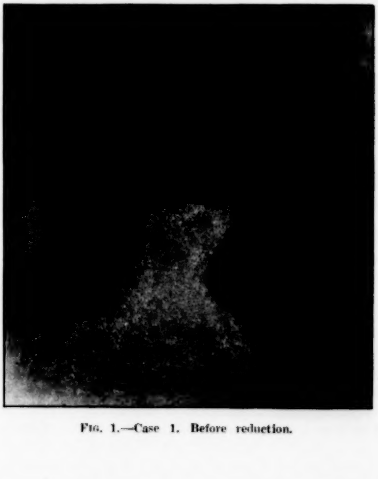

Fig. 1.—Case 1. Before reduction.

everted; slight bruise on thigh. Slightest movement caused intense pain. Measurement shows right leg three-quarters of an inch shorter than the left.

X-ray taken the following morning by Dr. A. E. O'Connell showed typical fracture of the neck of the femur. On the evening of the 26th, under ether, fracture was reduced and put up in the typical Whitman abduction position in a long plaster spica. On the fourth day patient was allowed to sit up in bed with right leg hanging over side. On the sixth day we got him standing with weight on cast and crutch under left arm for balance. Patient walked every day from that time on.

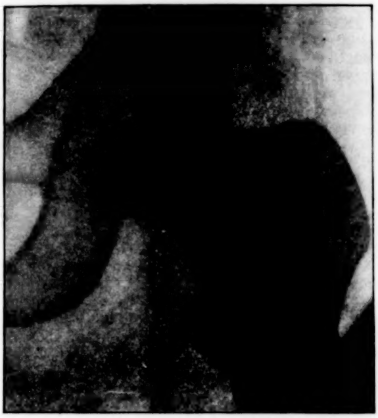

FIG. 2.—Case 1. After reduction.

X-ray was again taken at Dr. O'Connell's office, patient going in taxicab, and the reduction is here shown. (Fig. 2.)

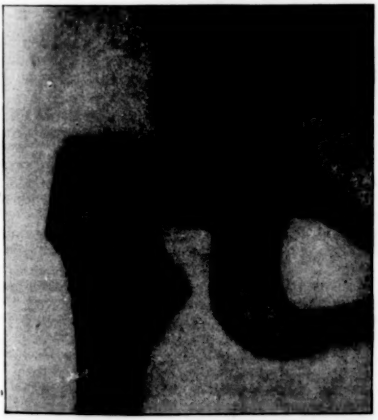

FIG. 3.—Case 2. Before reduction.

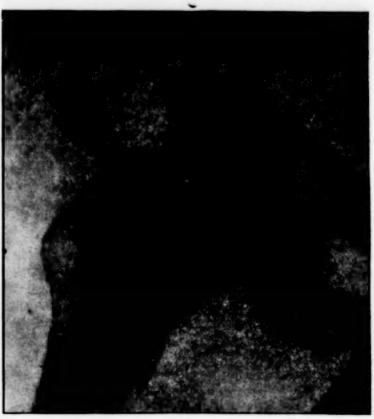

FIG. 4.—Case 2. After reduction.

Cast was renewed in eight weeks and a new one applied after four weeks more. This was cut off at the knee to allow motion. Cast was entirely removed at the end of sixteen weeks, and passive motion begun of hip and knee.

Present Condition.—Man is working in a wrench factory; walks without perceptible limp; there is no shortening. Patient is thoroughly satisfied and suffers no inconvenience.

CASE 2.—Mrs. C., aged 67 years. A well developed and nourished woman, active for her years. Three days previously fell from bottom step of basement stairs, striking on left hip. Was seen by her physician and referred to Memorial Hospital. Examination of left leg shows one-half inch shortening, with eversion of limb and typical picture of fracture of the neck of the femur.

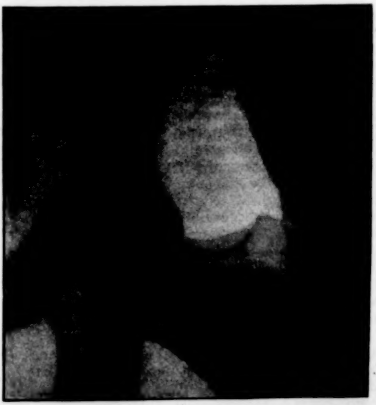

FIG. 5.—Case 3. After reduction.

X-ray (Fig. 3) shows condition. Under ether, fracture was reduced according to Whitman method, and plaster spica applied. X-ray taken two days following shows excellent reposition of fragments. Patient is still in hospital, but suffers no pain and is up every day in wheel-chair.

CASE 3. Mrs. K., age 50, a well developed and nourished woman. Tripped over door-sill, falling heavily on right hip. Seen by Dr. Curley of Milford and referred to Milford Hospital. Seen in consultation with Dr. Curley three days after injury. Patient lying in bed with hip slightly flexed, abducted slightly and everted. Measurements show right leg one and one-fourth inches shorter than left. Attempted motion painful, and picture is typical of fracture of the neck of the femur.

Unfortunately the x-ray had not been installed, so we were unable to get a picture before reduction. Patient was anesthetized and fracture reduced as in previous cases and plaster spica applied. In the meantime, the x-ray apparatus having been installed, a picture was taken through the cast, showing perfect reduction. Patient is now at the hospital, sitting up in bed and in wheel-chair without any apparent discomfort.

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Society Report.

AMERICAN UROLOGICAL ASSOCIATION.

THE annual meeting of the New England Branch of the American Urological Association was held at the Harvard Club of Boston on Thursday evening, November 15, 1917. Officers were elected for the ensuing year, and Drs. H. H. Howard and R. C. Wiggin were elected to membership. The program was as follows:

PRESENTATION OF SPECIMENS, INSTRUMENTS, ETC., AND REPORT OF CASES.

DR. QUINBY: I want briefly to call to your attention a subject old and yet ever new; illustrated by four cases with specimens of the commonest tumor of the kidney, the so-called hypernephroma—a very interesting tumor in spite of the fact that it is so common, because we know so very little about it pathologically. I have selected four cases illustrating, in the first place, the clinical diversity shown by kidneys bearing such tumors, and later I have just a few words to say on some of the more recent pathological ideas regarding this type of tumor.

In looking for the signs of these neoplasms we are usually taught to expect to find tumor, hematuria and pain. Very often, however, one or the other of these signs and symptoms is absent, and the diagnosis of a tumor of the kidney in such instances can be a very difficult diagnosis to make. This is illustrated by one of these cases. I will read them hastily, only mentioning the important points.

The first was a woman thirty-six years of age, who complained of a tumor of the abdomen. She had been told it was a tumor of the kidney, and she and her various physicians had known of it for nine years. Occasionally this mass was tender and gave slight discomfort. She had gone through four pregnancies, the last one being two and a half years before I saw her. Since the last pregnancy this mass had increased in size. She had lost but little weight. The diagnosis was confirmed by an injection of thorium, which showed a renal pelvis so deformed that there was hardly a suggestion of the outline of the normal calyx. The renal function, as determined by the phthalein output, was, on the left side 11%, and on the right side 10% in half an hour, illustrating the well-known fact that frequently in cases of kidney tumor the divided function is of no significance. The total function in this case for a two-hour period was 64%. The urine was entirely normal, excepting for an occasional cast. The tumor was removed. This case is typical of that group in which the tumor mass is practically the sole complaint.

The second patient complained of blood in the urine and had lost much weight. For ten months he had had recurring attacks of hematuria, during which his bladder would fill with blood. He was a cook on a coasting schooner, and so would go to a hospital where he happened to be in port, and be catheterized, and then go on; but the bleeding would recur in a few weeks. He had been catheterized in New York and at the Boston Relief Hospital only a few days before coming to the Brigham Hospital for hematuria. He presented on entrance marked strangury, a bladder distended up to the umbilicus, and complete inability to empty it of the blood clots. Instrumentation showed an exceedingly tortuous urethra with multiple strictures, so that the first thing to be done was a suprapubic drainage of the bladder under local anesthesia. This was followed in a few days by nephrectomy on the right side. A tumor mass was found attached to the kidney, which had penetrated through the capsule and was adherent to the retroperitoneal tissues. About a month later he developed a fistula in the wound, undoubtedly from local recurrence of the growth, so that, as a third operation, I made a laparotomy and found that the intestine involved was the descending portion of the duodenum. It was retroperitoneal, of course, and in a position exceedingly hard to control, on account of the friability of the tissues invaded with neoplasm. I tried to sew it up, but was unsuccessful. It was necessary to resect the pylorus and establish a posterior gastro-enterostomy. The patient died the next day. This second case is illustrative of the group in which hematuria is the prominent symptom.

In the third case the symptoms were different. There was pain in the back, but no loss of weight and no hematuria. It occurred in a woman fifty-seven years of age who had passed the menopause seven years before. She complained only of this pain and a swelling on the left side. On examination she showed a mass occupying the whole left quadrant, extending two or three inches below the umbilicus. Here the renal function did show some change. On the right, the normal side, it was 15%, whereas on the tumor side there was only 3% in a half hour. But here, again, the total phthalein was fairly reasonable, namely, 50%. The specimen shows that the tumor mass had been extensively converted into large blood cysts, and it was only after a search that I could find anything characteristic of hypernephroma tissue. This case is illustrative of that group which complain of pain.

Though tumor may be evident, it is not this for which the patient seeks relief.

The fourth case illustrates well that group in which it is hardest to come to an accurate diagnosis. These first three were comparatively easy, as they showed either pain or hematuria or a tumor. The patient was a very intelligent man who conducted a preparatory school for boys. He was sixty-two years old and had been entirely well until three weeks before entrance, when he came to the hospital complaining of a severe smarting sensation in the skin of his back below the angle of the right scapula. He said it felt as if the flesh were raw. A few days later he had the same sensation on the left back in an analogous place. The sensations came on forty or fifty times a day and lasted a few minutes. The touch of his clothing caused discomfort, but pressure and motion did not do so. About these very sensitive areas there was an ache, which at times radiated around to the front at the sternum. He also complained of pain in the right hip joint. There was no hematuria, and he presented only this area of extreme hyperesthesia and a continued slight pyrexia. In diagnosis the first thing to think of was shingles, in which the rash had not as yet come out, but that is not very often a bilateral affair, and as he was further observed it was immediately seen that the usual time for the appearance of a zoster rash had passed. The rash usually comes out much earlier than three weeks. Nine days after his entrance to the hospital we found a little microscopic blood in the urine. This led to exploration of his kidneys, and it was found that there was definite bleeding from the left side. There was never any palpable tumor, though one was suspected on account of the continued pyrexia, otherwise not to be explained. We were able, however, to show by cystoscopy a very definite though small amount of bleeding coming from the left side. Exploration of the left kidney showed a tumor, which took origin more in the cortical region of the kidney than in the other cases, and which had already made many metastases. In this instance it is interesting to note that the tumor had spread by the lymphatic channels, as well as by the venous, and had penetrated the diaphragm. The symptoms were caused by nerve-root involvement at about the sixth dorsal. Of course, extensive operation was of no avail. He steadily lost in weight and strength, and died within thirty days of the exploratory operation. Autopsy showed what I have just mentioned, that is, the nerve-root involvement which caused the pain. In this case any medical or surgical measure must come too late because the tumor caused no symptoms until the nerves were involved in metastases.

In regard to the pathology, you know there has been a considerable amount of argument advanced as to the origin of such a tumor. Dr. Wilson has put forth probably the most reasonable hypothesis regarding their origin. He says that they are not hypernephromata, but nephromata, and that the tumors take origin in the remains of the embryonic renal blastema which has not made the usual connections with the Wolffian duct, as it grows up from below to unite with the kidney tissue. The pathologists have considered them hypernephromata, following Grawitz, who based most of his claims on the fact that they contained fat and were similar in structure to the adrenal. As a matter of fact, more recent histological and chemical methods have shown that they do not contain much fat. What was considered to be fat is glycogen, and the clear transparent cells which one sees are clear because the method of fixation dissolves out the glycogen from the cell bodies.

During the investigation of tumors by the various cancer commissions all over the world, it was at one time hoped that the demonstration of mitochondria would throw some light on the question of malignancy. The theory was advanced that benign tumors had mitochondria in them and that cancer showed none. That this is far from true will be shown by the slide which I have under the microscope. For we know that these hypernephromata are always malignant but, nevertheless, their cells contain more mitochondria than any other type of tumor thus far studied. Thus the significance of such intracellular bodies is still a matter of speculation.

Dr. Phelps: I should like to report a case and show a picture of passing interest. A girl was admitted to the hospital, suffering from the ordinary symptoms of a cystitis. The cystoscope revealed what I thought was a small-sized stone. At operation we removed an ordinary rubber catheter, which, as near as we can find out, had been in the bladder for about five months. It was probably inserted to produce abortion, by some one not familiar with geography.

Dr. E. B. Young: I have had a case of somewhat the same nature as Dr. Phelps. This is a piece of gum elastic catheter which I removed from the bladder of a young woman twenty-three years old. It was inserted by the patient herself to produce abortion.

This catheter had been in the bladder for only two days, and it is remarkable for the amount of encrustation and other disturbances which it showed in that short time. The bladder was very much injected, tremendously edematous, and the folds of mucous membrane practically hid the catheter entirely, so that I was lucky to find it. The urine was smoky and foul. The patient has made a good recovery.

Dr. Gilbert Smith: I should like to mention the case of a young man at the Massachusetts General Hospital, who came in with a diagnosis of stricture. He did have a stricture, which was apparently traumatic, and he denied all venereal disease. After the stricture was cut we cystoscoped him because there were symptoms of stone and some blood, and we saw a bougie catheter coiled up in his bladder for its entire length. We removed it by the suprapubic route, under local anesthesia. Careful questioning failed to elicit any definite time when it was put in, unless it was twenty-three years before, when he said he was in the hospital for a broken leg or something like that, and had been unable to urinate, and thinks he was catheterized at that time.

Why the bougie catheter was used, I do not know, but there it was, and it was quite difficult to remove. It was not very much encrusted, but the varnish was pitted, and the thing was rough from the corrosive action of the urine.

Dr. Tenney: I wish to report an interesting case which occurred a month or two ago, when a glass clinical thermometer was removed from the bladder of a young woman seventeen years of age. The thermometer was unbroken. I had intended to bring it with me here tonight, but I forgot it. In the center is an encrustation of lime salts something like three-quarters of an inch in diameter. This thermometer was given to me by the doctor who removed it, and he pulled it out by main force.

DR. KEEFE: I should like to mention the case of a young man who had a hat pin with a black head, partly in his bladder and the rest of it in the urethra. We could not grasp it with the forceps, so I forced it down a trifle more and then pushed the point of the pin through the root of the penis. I then pulled the hat pin out, leaving the black head and reversing the direction of the penis, the head of the pin was made to emerge first from the meatus.

Paper by DR. W. F. BRAASCH, Mayo Clinic:

LITHIASIS WITH BILATERAL RENAL INVOLVEMENT.*

DISCUSSION.

DR. A. L. CHUTE: It seems perfectly hopeless to try to discuss points in a paper that has been so wonderfully presented as this one, but there are just two or three things I would like to mention very casually as they have occurred to me.

The first one is the lack of symptoms, that Dr. Braasch spoke of as causing one to think of stone in the kidney. He spoke of the finding of pus as being sufficient cause, but I do not think one should wait for pus in the urine before going over these patients with great care. There is a possibility of not seeing these stones with the most careful radiographic examination. I remember a case I spoke of at the meeting last year, which had been missed with the radiograph. The picture showed the outline of the kidney perfectly, and yet there was absolutely nothing to be seen in the line of a stone. When I cut down on that kidney I got a small, rather longish stone. To determine why we had not seen it we tried radiographing the stone in water. In the first place, it proved to be a uric acid stone. Left alone on the plate it showed a good shadow, but in water it showed absolutely nothing. The reason why x-rays were negative was that it was lying in the ureter with some urine around it. It shows that there are sometimes definite stones that we do not get by radiography, and that where symptoms point very definitely to stone in the kidney it is not sufficient to get a negative radiograph and stand by and do nothing.

Dr. Braasch spoke about leaving the stones in the kidney. To be sure, there was a pretty good reason for it every time he did it, yet it seems to me one has to have a very good reason for leaving them alone. In any case we are sounding a death-knell, so to speak, and it is only a question of time, although in some cases the death-knell would be sounded sooner if we took them out than if we left them in. On the whole, I think the best plan is to take out the stone as soon as feasible. Of course, there may occasionally be some reason why we have to put it off, but it is only a question of time when the kidney is going to be destroyed.

I want to express again my pleasure in Dr. Braasch's paper, and my great interest in it.

DR. KEEFE: I have thoroughly enjoyed listening to Dr. Braasch's lucid presentation of his subject. The vast experience which Dr. Braasch has had overwhelms me, and I do not feel that I can add anything that would be illuminating.

DR. TROWBRIDGE: May I simply make an allusion to what I saw three weeks ago at the Mayo Clinic? Dr. Judd was operating on a kidney, and he said to Dr. Braasch, "Is there any stone here, doctor?" Dr. Braasch said, "Yes," and I was rather amused at the uncertainty that Dr. Judd felt after exploring the kidney by making a slight incision in the pelvis. With his finger he brought out a little stone, and I felt then the great confidence that Dr. Braasch had in his cases, and how, when they had been examined, his conclusions were certainly justified.

DR. F. H. LAHEY: I have nothing to add to the paper, but in connection with Dr. Quinby's case, I would like to recall to your attention the method of treating duodenal fistulae, which occasionally occur in connection with right-sided nephrectomy, by means of an electrically driven constant suction pump. Apparently duodenal fistulae are rather unusual, but they occasionally occur following right-sided nephrectomy, and I think we should all bear in mind the possibility of closure of these fistulae by the constant suction pump. This is a pump which is worked very much like a dentist's pump, constantly keeping the fistula clear of fluid, and, particularly in small ones, allowing them to close, and bringing about a cure, which could be accomplished in no other way.

DR. G. O. CLARK: I would like to ask Dr. Braasch how many true cortical stones he has been able to demonstrate, in contradistinction to those formed in the pelvis?

DR. GILBERT SMITH: I wish to express my appreciation of Dr. Braasch's coming here, and of his very thorough presentation of his subject. Of course his experience has been very much greater than that of any one of us in regard to the matter of bilateral stones.

With reference to cases of bilateral stones that should not be operated upon, I have seen two cases that I remember of that type. One was a man who made the choice himself. He came to be cystoscoped but lost his courage. He had such huge calculi in both kidneys that I thought removing them would require nephrotomy on both sides, and would probably prove fatal.

The other case was that of a woman about fifty-five years of age who came to the out-patient clinic. She had a pyuria and symptoms of cystitis. There were large stones in both kidneys. Her total function was 5%, and we advised her not to have anything done.

The question of recurrence of the stone is very interesting. It seems to me there are certain types of cases which might be called malignant lithiasis, because if a stone is removed one year the patient comes back the next with another stone. I looked up a series at the Massachusetts General Hospital to find something about the composition of the stones in all the bilateral cases we had studied. The series was small, as there were only some half-dozen cases of bilateral stones. I found they were composed of calcium and triple phosphates, whereas a larger part of the unilateral stones and stones in the ureter were composed of oxalates. The phosphatic stones are the more rapidly growing. We have tried the effect of putting patients on a diet to prevent the formation of these malignant stones, and have given them a teaspoonful of chalk after each meal, following the work which was done at one of the United States Experiment Stations in Ohio, which proves that the output of phosphates in the urine is very much decreased if you can form insoluble salts in the intestines. I do not know whether it will prove to be any good or not. It seemed wrong to let these patients go on forming stones without doing everything possible to avoid it.

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* See JOURNAL, page 292.

That brings me to another point, which is that it is the surgeon's duty to operate with the idea of preventing recurrence. For instance, one might have a dilated calyx which contains a stone. If you remove the stone and do nothing to the calyx, you can be sure there is retention of urine in that calyx. I think that in some cases drainage of the kidney pelvis to reduce inflammation is good. A woman we did a few months ago had a pelvis filled with fine stone and gravel. It was solidly filled up with gravel, and the walls of the pelvis were covered with incrustation. We got out all we could and then drained the pelvis with rubber tubes. Of course she had a fistula, lasting for three weeks. I then put in a ureteral catheter. The fistula closed at once, and she went home with perfectly clear urine from that kidney.

In preventing the recurrence of stone after pyelotomy, there is not infrequently a pyelitis resulting, even if there was none before operation. In some cases, if you let the pyelitis run, the inflammation will favor the formation of stone in the future. One should try to prevent that by seeing that the pyelitis is cleaned up, if necessary washing out the kidney pelvis with silver nitrate a number of times to clean it out. In a couple of cases I did this, and the urine cleared up absolutely.

I want to again thank Dr. Braasch for the pleasure he has given us all.

Dr. L'Esperance: I wish at this time to thank Dr. Braasch for his very interesting paper. This interests me particularly because a year ago I passed a renal stone from my right kidney, and naturally what interests me greatly is the matter of recurrence. This stone was absolutely symptomless until I received a slight shock from a fall resulting from stubbing my toe. Following it, I accidentally noticed a hematuria, which continued for four months. It was impossible to demonstrate the presence of a stone by x-ray, until Dr. Dodd took pictures on a new machine recently purchased, and then only a faint shadow could be seen. In consultation with Dr. Hugh Cabot, it was agreed that, owing to the size of this renal stone, it would be passed without operation. By cystoscopic examination with the ureteral catheter in place, the position of the stone was shown to be about one inch from the orifice. Following several attacks of sharp pain, the stone was successfully passed through the urethra.

At the present time recurrence of the stone is what interests me mostly.

Dr. Quinby: In estimating the ability of the patient to withstand operation, I do not doubt that Dr. Braasch uses other methods than phthalein, but I want to make a plea for the use of blood urea estimation in doubtful cases, as being more accurate in some instances than the phthalein. It is a more delicate test. The first signs of improvement, as also the signs of failing renal function, are most delicately shown by the nitrogen content of the systemic blood stream in cases where both kidneys are involved. In unilateral affections of the kidney, when the opposite kidney is doing its work well, of course the blood urea estimations would be normal.

There is one other point. I want to go on record as agreeing heartily with what Dr. Smith has just said. The formation of stone rests on two main factors: one is infection, and the second, stasis in the kidney or in the bladder. We should not only combat the infection, but also, wherever possible, surgically try to put the kidney in a condition where it will drain properly, because stasis is just as important as infection in the causation of stone formation.

Dr. Braasch (closing): I wish to thank the members of the Society for their generous consideration of so long a presentation of statistics.

As to the existence of true cortical stones, I believe that they occur exceptionally, and then only secondarily to a localized area of necrosis. The majority of so-called cortical stones have their origin in the minor calices, and as they enlarge they invade the surrounding cortex.

The type of stone which is most frequently missed by the radiogram is the very thin, flat stone. If in taking the x-ray, the edge of the stone is exposed to the radiogram, it may easily be missed entirely. As Dr. Chute stated, we are occasionally justified in surgical exploration of the kidney where the patient's history and other data are strongly suggestive of stone, in spite of a negative radiogram. However, this should be done only in exceptional cases, and certainly not as a routine procedure.

In regard to the value of the blood-urea estimate, I have not discussed this because we have not employed it sufficiently to give any final opinion. After all, however, the practical value of all renal functional tests is not very great—so far as helping us to determine whether or not we shall operate is concerned. Our surgical judgment should depend upon the data derived from the radiogram, cystoscope, and physical examination—not upon the functional test. Where, however, the clinical examination leaves us in doubt as to the renal function, which occurs only in a very small proportion of cases, the functional tests may be of value. This is particularly true in the presence of marked renal infection, where toxemia of absorption leaves the patient in such a condition that he appears to be much sicker than he really is. The extremes of phthalein return alone are of practical value. If, on repeated tests, only a very low phthalein return (say 10% or less) is obtained, the advisability of operation in the absence of acute complications is questionable. A marked degree of blood-urea retention in conjunction with an extremely low phthalein return would be an additional factor against operating. Providing that there are definite surgical indications, I do not believe that a high blood-urea retention alone should render the case inoperable.

Book Reviews.

Operative Gynecology. By Harry Sturgeon Crossen, M.D., F.A.C.S., Associate in Gynecology, Washington University Medical School, and Associate Gynecologist to the Barnes Hospital; Gynecologist to St. Luke's Hospital, Missouri Baptist Sanitarium, and St. Louis Mullanphy Hospital; Fellow of the American Gynecological Society, and of the American Association of Obstetricians and Gynecologists. Seven hundred and seventy original illustrations. St. Louis: C. V. Mosby Company.

The endeavor of the author has been to present the operative treatment of gynecological disease fully, in all its bearings. He says: "The time is ripe for a systematic presentation of the various operative procedures available for the treatment of each gynecological lesion. Gynecologic surgery is entering a new stage of development. The past may be designated the period of invention of methods. To such an extent has this been carried out that for the treatment of uterine displacement alone more than one hundred operative procedures have been devised. The new stage of development may be designated the period of adaptation of operative methods to the exact pathological conditions present in the individual patient. The period of development is as important as the preceding one, perhaps more so when considered from the standpoint of lasting benefit to the patient." The details of general surgical technic and operations on the adjacent organs are omitted.

Within these narrowed limits the subject is covered in nineteen chapters. The plan of the author has been well carried out, and the handling of certain topics leaves little to be desired. Retrodisplacements of the uterus and prolapse of the uterus and bladder are treated at some length, and the catalogue of operative procedures for retrodisplacements of the uterus is exhaustive. The chapter on chronic inversion of the uterus shows the book at its best. Relaxations of the pelvic floor are fully discussed, but in the treatment of vesicovaginal fistulas one misses references to certain well-known and long-tried methods of exposure, as well as other resources of plastic surgery.

The subjects of inflammatory diseases and new growths are well covered, but the value of bisection in pelvic surgery is apparently not fully appreciated. The method of applying the Wertheim parametrial clamps, as shown in Figs. 453 and 454, is not that used by Wertheim, and is distinctly less advantageous. The ureter should be freed and displaced laterally, and the clamps passed under the ureter from the median side. The Percy heat method of treatment of cancer of the uterus is well described and its value properly estimated.

Two timely chapters are on gynecological surgery in nervous patients, and on medicolegal aspects. These serve as indicating points which deserve attention, rather, as complete discussions.

The balance is not always well preserved. For example, the exhaustive list of operations for retrodisplacements of the uterus would better be relegated to a monograph or to a history of gynecology. The space devoted to ovarian transplantation is too great for the actual, though perhaps not for the potential value of the procedure. The list of operations at which a foreign body has been left in the abdominal cavity may not be too long to emphasize the danger of such an accident, yet it seems out of place in this book. The arrangement of the text might be improved by considering technic or technique and indications in a uniform order.

The book, in addition to these minor faults, has certain major virtues, and is to be highly recommended. The descriptions are clear and the illustrations are abundant, well-selected and adequate. In matters of opinion, the surgical judgment of the author is sound.

The press-work represents a marked advance from the author's medical gynecology issued by the same publishers.

Candy Medication. By Bernard Hantus, M.D., Professor of Pharmacology and Therapeutics, University of Illinois. St. Louis: C. V. Mosby Company.

This monograph, presumably the only book on the subject thus far published in any language, aims to present the author's method of medication through the medium of candy tablets, which he believes particularly effective in the administration of drugs to children. He describes the method, and machine required for making these tablets, and the uses to which they may be applied. He enumerates the drugs which may be administered by this method, and describes the method of constructing formulae for the manufacture of the tablets. More than half the book consists of a series of sixty-six prescriptions arranged in a formulary with full directions for the manufacture of each. The volume closes with an index and a series of nine references to previous writings on this subject by the author, and by Sawyer, Fuller, Schleimer, Wood and Lloyd. The subject is one of interest, and its practicability would seem to make it of value in the pharmacology and therapeusis of pediatrics.

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CENTRALIZATION OF AUTHORITY VERSUS UNPAID BOARDS OF TRUSTEES.

IN these war times the atmosphere of strict military discipline and the centralization of all authority is very much in the air. As far as a fighting force like an army is concerned, centralization and the placing of authority in the hands of a few capable persons is much to be desired. It does not necessarily follow, however, that methods which for many years before the war have proved their usefulness and efficacy should be cast to one side and entirely done away with in order to conform with present military methods. There is a very present danger of this being done, however, in certain important instances, unless the medical profession protests against such an unwise procedure.

Take, for example, the question of the unpaid boards and commissions, which for many, many years have, in Massachusetts, demonstrated their value. There has been criticism in the past of the work of such boards, whether they have been in charge of institutions for the insane, for the tuberculous, for delinquents, or others; but, notwithstanding these criticisms, and notwithstanding attempts to prove that this method of handling affairs is inefficient and wasteful, the fact remains that these unpaid boards of trustees and the work they are doing have stood the test of time and stood it well; the fact remains that our state institutions, whether for the insane, the tuberculous, or delinquents, stand among the best in this country.

The report of a Recess Committee on Administration and Finance, appointed to investigate and report on the question of the consolidation of various boards and commissions and the doing away with certain unpaid boards of trustees, is before the Legislature for consideration. Among others, it recommends that the Board of Trustees of Hospitals for Consumptives be transferred to the State Department of Health. Another bill, emanating from New Bedford, based, we believe, on personal grounds more than anything else, recommends the abolition of the Board of Trustees of Hospitals for Consumptives, and that its duties be transferred to a special bureau of the State Department of Health. The chairman of the Board of Trustees of Hospitals for Consumptives, and the other trustees themselves, would heartily welcome any such change as this, which would relieve them of many irksome duties, could it be demonstrated that such a change would benefit the cause of preventing tuberculosis in Massachusetts and the welfare of our unfortunate consumptives. We do not believe, however, plausible as this scheme sounds, that this can be demonstrated. We do not feel that this Board needs any defense; the work it has accomplished during the ten years of its existence in the prevention of tuberculosis in this State speaks for itself. It is well to bear in mind certain facts concerning the progress that has been made in fighting tuberculosis in Massachusetts during the past ten years. It, likewise, should be borne in mind that the State Department of Health has, of its own accord, and wisely, left the tuberculosis problem, to a very large extent, in the hands of the Board of Trustees of Hospitals for Consumptives, believing that by so doing it was in good hands.

When the Board above mentioned, of which the late Dr. Arthur T. Cabot was chairman and the guiding mind until his death, took hold of the situation there was one state sanatorium, at Rutland, with 350 beds. The number of other beds in the state of Massachusetts was very limited. Since that time the state sanatoria at North Reading, Lakeville and Westfield have been built, bringing the total number of beds in our state sanatoria up to well over 1000, while, in addition, under the direct supervision of the Board of Trustees of Hospitals for Consumptives, local tuberculosis hospitals have been constructed, and at the present time county hospitals are being built, which will bring the total number of beds to well over 4000. We believe that the proportion of beds to the population is as great in Massachusetts, if not greater, than any other State in the country. The death rate from tuberculosis per 100,000 population in Massachusetts in 1907 was 150.6. The present death rate is 119.5. The weekly per capita cost at the state sanatoria up to the present war was in the neighborhood of $9.00. It is naturally more at the present time. We believe, however, that this weekly per capita cost is as low, if not lower, than that of other institutions outside of Massachusetts. Despite the fact that the state sanatoria are not limited to incipient cases, we believe that the results of treatment will compare favorably with those of other state sanatoria elsewhere. We believe that it would be impossible to combine in any single-headed commissioner, of no matter how high a standard, the quality, skill, and faithfulness to its aims and ideals that is now to be found in the present board of trustees, while from the question of dollars and cents alone, it is manifest that the cost of a special commissioner, necessarily at a high salary, and of the various deputies which he would have to have, will be infinitely greater than the expense of the present unpaid board. Not only do we believe it unwise to make such a radical change as this at the present time, but, also, we believe that it should be clearly demonstrated that such a change would be beneficial. This has yet to be done.

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STATE QUOTAS OF BABIES TO BE SAVED DURING CHILDREN'S YEAR.

The Children's Bureau of the United States Department of Labor announced on February 25 the number of lives each state is asked to save in the campaign to save 100,000 babies and young children during Children's Year, beginning April 6. Announcement of the purpose to initiate such a movement was made some time ago by the Children's Bureau and the Child-Welfare Department of the Woman's Committee of the Council of National Defense, and the response, which has surpassed all expectations, indicates that efforts to promote the health and welfare of children are to be more vigorous this year than ever before.

The saving of 100,000 lives of children under five is only one part of the program for the welfare of 30,000,000 children under fifteen in this country. It is realized by all concerned that the standards of child protection must not be relaxed during war time, and the United States is expected to profit by the experience of other warring countries, where the importance of safeguarding childhood is emphasized as never before.

The movement to save 100,000 lives of babies and young children in the United States during the second year of the war is to be begun by a National Weighing and Measuring Test beginning April 6, the anniversary of the declaration of war by this country. In announcing the quotas the Children's Bureau said:

"In order that each State may feel responsible for a definite number of lives to be saved, quotas have been assigned to the various States, the apportionment being made on the basis of the population under five according to the 1910 census. This, of course, cannot take account of the varying death rates in the different States where death rates are known.

In about half the States of the Country, comprising nearly one-third the population, the registration of deaths was not sufficiently complete to warrant their inclusion in the registration area when the latest reports were published. The registration of births is seriously deficient in a still larger number of States. For that reason the apportionment of quotas of infant lives to be saved could not be made upon the basis of the infant mortality rate, which is based on the number of deaths under one year and the number of recorded births. Thus the only basis for the assignment of quotas uniformly applicable to all the States is the population as shown by the Federal census. As the effort for the hundred thousand lives applies to the specially hazardous period of life under five years of age, the quotas are calculated upon the basis of the population under five.

In making the apportionment on this basis it was realized that a high mark is thus set for

States in which the death rate among young children is already low. On the other hand, the mark set may be low for some States where the child death rate is excessively high. It does not appear to be possible to avoid some situations of this kind by any method of apportionment that could be devised with the data now at hand. If the registration of births and deaths were complete in all the States, an apportionment of quotas of the 100,000 lives to be saved by the various States could be made upon a different basis.''

Plans for the celebration of Children's Year, of which the saving of 100,000 lives is one feature, are being developed by the Children's Bureau in coöperation with the Child-Welfare Department of the Woman's Committee of the Council of National Defense. The safeguarding and protection of children is looked upon as a patriotic duty in view of the unavoidable wastage of human life incident to war. It is expected that the 5000 or more local committees of the Child-Welfare Department of the Woman's Committee will be able to carry the campaign to every community in the United States. This is looked upon as essential to the success of the movement, for in the last analysis, every community must save its own babies if they are to be saved at all. State and Federal agencies, either official or voluntary, can make plans and offer suggestions, but each community must bear its full share of responsibility in making the campaign a success.

MEDICAL NOTES.

The Brattleboro Mutual Aid Association.—The tenth annual report of the Brattleboro Mutual Aid Association for the year ended October 1, 1917, records that 167 maternity cases were cared for during the year. The maternity nurse made 365 prenatal visits. A clinic was held at the Association Home, where 41 children under five years of age were examined by the physicians and dentists of the town, each one giving his services for one hour or more. Those requiring attention were later visited by a nurse and advised as to their care. The great demand for trained attendants has impelled the Association to establish a school called the Thompson School for Training Attendants in Household Nursing. Women who enter this school are given a standardized training to work for household nursing organizations under graduate nurse supervision. These attendants or household nurses supplement the work of the graduate nurse and take the place of the second when two are required. They also help to care for the children and the home when necessary during the mother's illness.

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending Feb. 16, 1917, the number of deaths reported was 332, against 287 last year, with a rate of 22.07, against 19.37 last year. There were 45 deaths under one year of age, against 45 last year.

Ths number of cases of principal reportable diseases were: diphtheria, 76; scarlet fever, 32; measles, 176; whooping cough, 52; typhoid fever, 2; tuberculosis, 59.

Included in the above were the following cases of non-residents: diphtheria, 7; scarlet fever, 9; tuberculosis, 10.

Total deaths from these diseases were: diphtheria, 4; scarlet fever, 1; measles, 1; whooping cough, 2; typhoid fever, 1; tuberculosis, 22.

Included in the above were the following non-residents: diphtheria, 1; tuberculosis, 2.

Meeting on War Surgery.—A meeting of the Boston Medical Library in conjunction with the Suffolk District Medical Society was held in the Library on February 13, 1918. The general subject of the evening was War Surgery. The speakers were Col. Dercle of the French Mission and Maj. Edward Archibald of Montreal.

Springfield Academy of Medicine.—The February meeting of the Springfield Academy of Medicine was held on February 12. Dr. William P. Graves of Boston spoke on "Ovarian Organotherapy." Dr. Smith began his course on "Circulatory Disease" on February 15.

Effect of Cold Weather on Death Rates.—The published figures of the Boston Board of Health show that for the month of January the death rate was not increased by the severe weather, but was better than usual. The rate was nearly 8% less than last year, and many of the communicable diseases showed a marked decrease.

"The only death statistics which show an increase for January are those for the babies. It is generally believed that the cold and possibly the high prices of food are responsible.

The number of deaths of babies under one year in January, 1918, was 188, as compared with 167 in January, 1917. The month of December, 1917, however, showed only 162 deaths, as compared with 176 in December, 1916. The number of deaths of persons over 65, who usually suffer severely from cold, was 416 in January, 1918, against 502 in January, 1917. The total number of deaths in January of this year was 1264. Last January the figures were 1365.

Insanity in Massachusetts.—The annual report of the Massachusetts Commission on Mental Diseases for the year ended November 30, 1916, states that the whole number of mentally affected persons under its care October 1, 1916, was 18,718, being 1 such person to every 201 of the estimated population of the State. Of this number, 15,048, or 80%, were insane; 2885, or 15%, feeble-minded; and 670, or 3%, epileptic (sane). Their increase for the year was 581. The increase of such persons under public care for the year was 575; their average annual increase for the last five years, 591. The causes of insanity assigned by the physicians of the hospitals were physical in 2036, or 63.93%; mental in 132, or 4.14%; unknown in 997, or 31.30%; and not insane in 20, or .63%.

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Miscellany.

HENRY MAUDSLEY, M.D. LOND., F.R.C.P. LOND., LL.D. EDIN.

The *Lancet* has recently published an extensive obituary notice of the late Dr. Henry Maudsley, one of the foremost thinkers and writers in the world on mental physiology and pathology, who died at Bushey Heath, on January 23, in his eighty-third year. The following extracts may serve to give an adequate idea of his life, activities, and contributions to science:

"The third son of the late Thomas Maudsley, Henry Maudsley was born at Rome, near Settle, Yorkshire, in 1835, and was educated at Giggleswick School and at University College, London. He graduated in 1856 M.B. of the University of London, winning the gold medal in surgery, and proceeded to the M.D. degree in the following year. His early bias was in favour of surgery, but one of his first appointments was that of resident physician to the Manchester Royal Lunatic Hospital, which post he held from 1859 to 1862, so that his acquaintance with his special subject was literally as long as his long working life. In 1864, having come to London, he was appointed a physician to the West London Hospital, and thus obtained the chance of acquiring familiarity with general pathology. In 1869 (the year in which he was made a Fellow of the Royal College of Physicians of London) he became professor of medical jurisprudence at University College, a post which he held for ten years, when he resigned in order to concentrate entirely upon the responsibilities of a large and important practice as a psychiatrist.

His reputation grew as much, however, from his literary as from his practical work. As far back as 1862 he had been appointed editor of *Mental Science,* a journal which he ably conducted for nearly 20 years. His first original contribution to the literature, which he so enriched, of mental processes in health and disease, was comprised in his Goulstonian lectures on the 'Relations between Body and Mind, and between Mental and Other Diseases of the Nervous System'; these were delivered and published in 1870. In 1874 he wrote 'Responsibility in Mental Disease,' which has gone through five editions; in 1876, 'Physiology of Mind,' and in 1879, 'Pathology of Mind,' both of which have passed through two editions. In 1883 he published 'Body and Will,' and in 1887 'Natural Causes and Supernatural Seemings,' a wonderfully able book, whose materialistic views in certain places gave considerable shocks to the orthodox. In 1902 'Life in Mind and Conduct' appeared; in 1903, 'Studies of Organic and Human Nature'; and in 1908, 'Heredity, Variation and Genius.' His latest work, 'Organic to Human,' appealed mainly to the scientific student of psychology and sociology, whether without or within the ranks of the medical profession. It must indeed be considered chiefly as an important contribution to the still vexed controversy between the warring schools of 'materialists' or 'mechanists' on the one hand and of 'vitalists' or 'spiritualists' on the other. It fixes his place as a scientific thinker, for justly preëminent though he was as an authority on the subject of insanity, and much as his other work owes to his practical knowledge and experience in this special study, his most enduring title to fame will be that of the scientific philosopher who in his day and generation consistently and persistently upheld the principle of the unity of the human organism and its continuity with the rest of nature's processes. From his literary work alone he gained a wide reputation; he was an honorary member of the Medico-Psychological Society of Paris, of the Imperial Society of Physics, Vienna, and of the Medico-Legal Society of New

York, and his teachings received practical endorsement in all parts of the scientific world.

In February, 1908, Dr. Maudsley, who had done so much by his writings for the advancement of the study of psychiatry, made the munificent offer of £30,000 to the London County Council to provide a hospital for the early treatment of cases of acute mental disorder, whereat scientific research might be pursued and an educational institution provided for medical students. He had already communicated to Dr. F. W. Mott his intention, and Dr. Mott pointed out to him the desirability of associating such a hospital with the University of London and privately communicated this wish of Dr. Maudsley to the chairman of the Asylums Committee. Dr. Maudsley's generous proposal was made officially to Mr. H. P. Harris, then chairman of the London County Council, and in a letter to Mr. Harris, dated Feb. 14, 1908, he entered clearly into the motives behind his public beneficence. He said that as a physician who had been engaged in the study and treatment of mental diseases for more than half a century he had been deeply impressed with the necessity of a hospital whose main object should be the early treatment of cases of acute mental disorder, with the view, so far as possible, of obviating the necessity of sending them to the county asylums; the promotion of exact scientific research into the causes and pathology of insanity, with the hope that much may yet be done for its prevention and successful treatment; and the provision of an educational institution which should offer to medical students the opportunities of getting good clinical instruction in a class of diseases of which under existing conditions it is not easy for them to obtain a competent knowledge.

Dr. Maudsley's gift of £30,000, which had the inspiration we have just set out, having been accepted by the London County Council, a site was eventually found at Denmark Hill. On the outbreak of war the hospital was hastily completed, and is now used as a military hospital for the treatment of war psycho-neurosis, and whatever may be its future career, posterity will regard its originator as one who has done much to break down the artificial barriers which for so many decades separated mental from physical disease:

We close this notice of a remarkable man with a few words of personal reminiscence from Colonel Mott. He writes:

'I always much enjoyed my visits to Bushey Heath as I profited much by conversing with a man who was a broad-minded philosopher with a remarkable intellect and memory. In fact, he retained all these faculties to the very end. I conversed with him only the Sunday before he died. He took a great interest in the hospital which bears his name and which owes its existence to his great generosity. He was especially pleased when I told him that a number of American officers had been studying the psychoneuroses under my direction. He showed a special interest in my personal affairs. He told me that he did not wish to live any longer; at the same time, when I said the sun would shine again and I hoped he would live to see what had been done by the soldiers in making the gardens of the Maudsley Hospital fruitful, he brightened up. For he thoroughly agreed with me that employment was the best mode of treatment in convalescence of these cases. I often had propositions to make to him regarding the hospital and grounds, the pathological laboratory, and the research work carried on there, and he would criticize my remarks with much force and scientific acumen, partly, I think, to draw me out, partly it was his nature not to accept any statement without examination. In discussing general topics, such as politics and social problems, one learnt to respect greatly his shrewdness, wisdom, and knowledge of human nature and the motives of men. He used often to say to me, "You are an optimist," and I retorted, "You are a pessimist." When I got to know him intimately I found an extraordinarily kindly nature beneath what at first might appear to have been a satirical and cynical attitude towards mankind generally. This was no doubt due to the fact that he hated sham, humbug, and vainglorious people of all grades, religion and professions. His wife was the youngest daughter of John Conolly, of Hanwell, a great pioneer in lunacy reform. A few years ago he contributed a sum of money to commemorate Conolly's name at Hanwell. I think his wife, who was a very sweet woman, must have helped him with the idea of building a hospital. He told me that she was his "foolometer"; by that he meant he read over his MS. to her and confided in her his plans. Dr. Maudsley had the greatest mind of anybody that I have had opportunity of knowing intimately. His knowledge was not only profound and extensive, but accurate. He was a great Shakespearian scholar, and this is revealed in his writings; and he would quote passages not only from the Bible and Shakespeare, but from most of the great authors and poets, so that after dining and spending the evening with him, I would come away sometimes humbled, but always mentally refreshed. He had a remarkable knowledge of the works of the great philosophers, ancient and modern, and he frequently told me that he had a profound admiration for the philosophy of Spinoza. In his early days he was apprenticed to Clover at University College Hospital, and it was interesting to hear his opinion of the members of the staff of the hospital in his time. He was a good bowls player, and later in life he attended Lord's cricket ground pretty regularly, and I was surprised when I first met him to find this great philosopher knew far more about the style of play, the capacity for run-getting and bowling of well-known cricketers than I did. It is said that as a student he never seemed to work, and yet he carried off all the prizes at University College Hospital.' "

RETIREMENT OF GENERAL KEOGH.

THE British War Office has recently issued a communication announcing the retirement of Surgeon-General Sir Alfred Keogh from the position of Director-General of the British Army Medical Service:

"It is with great regret that the Secretary of State for War has decided that the time has come when Surgeon-General Sir Alfred Keogh, G.C.B., M.D., F.R.C.P., Director-General of Army Medical Services, must be permitted to resume his duties as General Executive Officer to the Imperial College of Science and Technology, and he will be replaced at the War Office from March 1 next by Colonel T. H. J. C. Goodwin, C.M.G., D.S.O., Royal Army Medical Corps, until recently the Assistant Director of Medical Services to the British Recruiting Mission in America, who will be appointed Acting Director-General of Army Medical Services.

Sir Alfred Keogh's services were placed by the Governors of the Imperial College of Science and Technology at the disposal of the War Office at the beginning of the war, and although during the last three years they have on several occasions requested that he should return to his former duties, owing to the development of matters of great national urgency which are delayed by his absence, it has not hitherto been possible to spare him.

It is very largely due to Sir A. Keogh's intimate knowledge and grasp of all matters connected with the Army Medical Services and the medical profession generally that the medical needs of the army have been met to the fullest extent during the war, and he has been able to secure the assistance and advice of various committees of eminent consultants, which it is hoped will continue to be at the disposal of his successor."

Commenting on General Keogh's retirement and the appointment of his successor, the *British Medical Journal* writes in part as follows:

"Sir Alfred Keogh was born in 1857 and received his professional education at Queen's College, Cork, and Guy's Hospital, London. He took the degrees of M.D. and M.S. at the Royal University of Ireland in 1878. After holding the appointment of house-physician at the Brompton Consumption Hospital he entered the medical department of the army in 1879, coming out second of nearly seventy successful candidates. This was the first batch of officers commissioned under the Warrant of 1879. For a considerable time before that the discontent in the service had been so acute that there had been the greatest difficulty in getting suitable men to come forward. At Netley Sir Alfred Keogh won the Martin Memorial Gold Medal and the Herbert Prize, and passed out with the highest total of marks of all the candidates—army, Indian, and naval. His first tour of foreign service was in Bermuda, whence he proceeded to India. On his return he was on duty at the Royal Arsenal, Woolwich, for five years; during that period he gained a large surgical experience. On completion of this appointment in the beginning of 1894 he was sent to India, where he served in the Madras Presidency; later he was transferred to Barrackpore, near Calcutta, where he was in charge of the Military Hospital. He was also civil surgeon there, and in that capacity had large opportunities of ordinary professional work among the operatives in the factories and civilian population. He returned to England in 1899, and in November went to South Africa as Secretary and Registrar of No. 3 General Hospital, which was at Rondebosch, near Capetown, in the early part of the war. When Bloemfontein was taken hospital accommodation was required on the lines of communication, and Colonel Keogh was sent to Springfontein with half of No. 3 General Hospital, and while there he was for a short time principal medical officer of the lines of communication from Bloemfontein to Norval's Pont.

He was soon transferred to Pretoria to take charge of No. 2 General Hospital, which he raised to a high state of efficiency. In November, 1900, it had 1000 beds, and this number was maintained till the following March. He was also Senior Medical Officer of 'Howitzer Camp,' which included the Langman Hospital, and direction of the sanitation of the eastern outskirts of Pretoria. At the end of 1900 he contracted enteric fever, and was invalided home in February, 1901. He was mentioned in Lord Roberts's first dispatch, received the decoration of C.B., and was specially advanced from the lower to the higher rate of Lieutenant-Colonel.

When the reform of the Medical Service of the Army was undertaken, he was invited to join Mr. Brodrick's Reorganization Committee. His work as a member of that was of the highest value. He was appointed Deputy Director-General from January 1, 1902.

On January 1, 1905, he was appointed Director-General, and retained that office until 1910, when he was appointed Rector of the Imperial College of Science and Technology, South Kensington. During his first period of office as Director-General the medical service of the Territorial Force was organized, and the system of Territorial hospitals with staffs drawn from the civil hospitals in the various localities was brought into existence.

Sir Alfred Keogh retires from the office of D.G., A.M.S., leaving behind him the reputation of one of the greatest organizers and administrators the army has produced. It was not an accidental coincidence that he and Sir William Robertson received the G.C.B. on the same day about a year ago. When he took up the office for the second time, in October, 1914, he knew that he had undertaken a task beset with difficulties. He succeeded in carrying day after day a burden of responsibility and labour which only a man of his energy, enthusiasm, and mental calibre could carry. He had to meet at once the medical needs—which then seemed immense—of the new armies of men who voluntarily responded to Kitchener's appeal. The response came in a manner redounding to the everlasting honour of the British medical profession. The response must have heartened Sir Alfred Keogh in those difficult early days after Antwerp and the first battle of Ypres. It would have been made whoever had been in his place, but it was made more readily and with more confidence because he was there. Men at such moments do not stop to analyze the springs of their conduct, but there can be little doubt that the spontaneity of the response was in part due to the feeling that Sir Alfred Keogh was one of us; that through his long years of military administration he had never forgotten that he was a doctor first and a soldier afterwards. He has said this or something like it very often, and his record in the service would stand as evidence had he never said it. The work of the enlarged Army Medical Service, of which he has had the central direction, has been greatly successful in the prevention of disease, in the treatment of the wounded and sick, and in their transport and hospitalization. The first urgent problem of the war on the Western front was raised by the frequency of wound infections of extraordinary severity and of types which, if not new, were unknown except by name to modern surgeons. Then appeared at once the wisdom of the appointment of consulting surgeons, physicians, and pathologists, and the establishment of clinical and research laboratories under the direction of skilled men of the younger school. In all this Sir Alfred Keogh has shown a quality which distinguishes a great from a good administrator, a quality which he shares with his distinguished colleague in France, Sir Arthur Sloggett, of encouraging men of capacity, in the words of Harvey, 'ever to search out and study the secrets of nature' at the bedside or in the laboratory. In the course of his multifarious work of the last three and a half years Sir Alfred Keogh has had to touch the fates of ten thousand medical men of all ages, dispositions, and clinical acquirements. That the Army Medical Service has during these times always succeeded in using its civilian recruits to the best purpose would be to claim too much. It is not in mortals to avoid mistakes, but we are quite sure that throughout it all the retiring Director-General has been inspired by a real appreciation of the importance of scientific methods, by a genuine love of his profession, and a whole-hearted desire to do the best possible for the armies and for the sick and wounded. In choosing Sir Alfred Keogh's successor, the precedent recently created in other branches of the army, of looking to the younger men, has been followed. Colonel Goodwin, who entered the R.A.M.C., in 1893, is not yet 47. He served with distinction in frontier expeditions in India and has won golden opinions in this war, where he served in France from the earliest stage, as more recently in America, to which country he proceeded as a member of Mr. Balfour's mission last spring. He has a difficult succession; we wish him every success in the high office to which he is called."

MEDICAL MATTERS IN MESOPOTAMIA.

The *British Medical Journal* has recently published the following extract, relative to medical matters in Mesopotamia, from the last dispatch of the late Lieutenant-General Sir Stanley Maude:

"During the five months ending April there had been continuous fighting, and during that month the enemy was driven back on divergent lines with the capture of 3000 prisoners, 17 guns, and a considerable quantity of rolling stock and booty. All objectives had been secured, but the increasing heat rendered it necessary to redistribute the troops for the hot weather, and to make every possible provision to guard against the trying hot period approaching. The bulk of the troops were withdrawn into reserve and distributed in suitable camps along the river banks, where they could obtain the benefit of such breezes as blew, and where a liberal supply of water for drinking, bathing, and washing was obtainable. The heat was intense during the later part of June, in July, and at the beginning of August; consequently movements could not be undertaken by either side without grave risk of incurring substantial casualties from heat-stroke and heat exhaustion. The troops enjoyed a well-earned respite during the five months May to September. Sports, which are so essential to the well-being of the soldier, especially when temporarily inactive in a military sense, were freely indulged in, with beneficial results to the health and future fitness of the army for service in the field. Minor operations were, however, carried out during May, June, and July, and on July 8 Sinn El Zibban, on the Euphrates, was occupied. A further advance was interrupted by a blinding sand storm and a heat wave.

Active operations on the Euphrates were resumed on September 26, and Ramadie was entered on September 29, the Turkish commander and his staff being captured. During these operations the heat by day was considerable, and as they were conducted at some distance from the river they were only rendered possible by the excellence of the arrangements for water supply. The captures included 3454 prisoners, of whom 145 were officers, 13 guns, 12 machine guns, 2 armed launches, 2 barges, and large quantities of arms, ammunition, equipment, and stores. The dispatch contains the following reference to medical arrangements. Unfortunately, before it could be received Sir Stanley Maude had himself succumbed to cholera.

'The health of the troops during the summer months has been uniformly satisfactory, and many of the diseases from which we suffered in previous years—such as cholera, enteric fever, and scurvy—were either non-existent or negligible in their extent. This successful result was partly attributable to the untiring work of the officers employed in the bacteriological laboratories, without whose valuable assistance the difficulty of dealing with the epidemic diseases would have been considerably increased. But, although better conditions as regards accommodation and increased facilities for combating the heat resulted generally in a far lower sick-rate, an abnormal heat wave which swept over the area in July was responsible for a heavy casualty list. During this time the personnel of the medical services were severely taxed, but they resolutely and successfully responded to the calls made upon them. All ranks redoubled their exertions as the situation became more difficult, and the unremitting labours of the nursing sisters, many of whom suffered in health themselves, were worthy of the high record for devotion to duty which the nursing service has always maintained. The very practical assistance rendered by the British Red Cross Society and Order of St. John during this trying period was typical of the valuable services so consistently rendered by that organization.' "

A MEDICAL DRAMATIST.

A correspondent of the *Lancet* has recently contributed to that publication the following communication relative to Dr. Michael Clancy, a little-known medical dramatist of the eighteenth century:

"In the scanty list of dramatists of the medical profession one seldom sees mention of Dr. Michael Clancy, who was born at Clare about 1700 and educated at Trinity College, Dublin, and who afterwards became a medical student at Bordeaux and graduated Doctor of Medicine at Rheims. He lived many years in Dublin, had a respectable practice and a good reputation, but lost his sight in 1737.

Being incapable of following his profession, he commenced to write for the stage, and in 1739 produced at the Smock Abbey Theatre in Dublin a tragedy entitled *Tamer, Prince of Nubia*. His next attempt was a comedy, called the *Sharpers*, which was praised by Dean Swift. Another tragedy, called the *Extravagant Zealot*, was produced in 1746, and, according to the London *Advertiser*, was greatly applauded. This same year he staged *Tiresias*, the Blind Prophet in Dryden, and Lee's tragedy of *Œdipus*, and King George II granted him a premium of £40.

At the same time another medical dramatist, also an Irishman, had some vogue. Paul Heffernan was born in Dublin in 1719 and studied medicine in France, where he took the degree of Bachelor of Medicine, probably at Bordeaux. He was no brilliant success in the practice of medicine, but was concerned in a political paper called *The Tinkler*, written in opposition to the famous patriot, Dr. Charles Lucas. Garrick produced a farce of his called *The New Hippocrates* at Drury Lane in 1761, and a little piece called *The Lady's Choice* was brought out at Covent Garden in 1759. The celebrated Mrs. Abingdon produced his comedy of *National Prejudice* for her benefit in 1768. Garrick stood in some awe of him, but Croker says he had only very moderate ability, and a ready vein of scurrilous vulgarity. Some amusing and extraordinary anecdotes are related of him in the twenty-fifth volume of the *European Magazine*."

Correspondence.

VACCINATION CERTIFICATES.

The Massachusetts Medical Society,
Office of the President,
58 Pearl St., Worcester, Mass.,
February 22, 1918.

Mr. Editor:—

The Committee on State and National Legislation approves of and has worked for House Bill No. 752 now before the Legislature, which will require a vaccination certificate from children attending private as well as public schools in the state, and which also provides that physicians who give certificates which state that a child ought not to be vaccinated on account of danger to its health must at least *see* the child so exempted from the law before signing such certificate.

The principle involved has received the endorsement in writing of the presidents of practically every college and university in the state, of the principals of the leading academies, of the Roman Catholic bishops of Springfield and Fall River, of His Eminence Cardinal O'Connell and of the State Board of Health. I ask that each member of the Massachusetts Medical Society constitute himself a committee of one to impress upon his senator and representative the importance of supporting this measure in the interest of the public health.

Samuel B. Woodward,
President, Massachusetts Medical Society.

SOCIETY NOTICE.

New England Pediatric Society.—The fifty-second meeting of the New England Pediatric Society will be held at the Boston Medical Library, on Friday, March 8, 1918, at 8.15 p.m.

The following papers will be read:

1. Pyloric Stenosis.
   William E. Ladd, M.D., Boston.
2. Studies of Infant Feeding. X.
   The Digestion and Absorption of Fats.
   A. W. Bosworth, Boston.
   H. I. Bowditch, M.D., Boston,
   Louise A. Giblin.
   From the Boston Floating Hospital Laboratories.
3. Extremes in Infant Feeding. The Present Tendencies. Fritz B. Talbot, M.D., Boston.
4. An Original Scheme for Demonstrating Infant Stools. J. I. Grover, M.D., Boston.

Light refreshments will be served after the meeting.

Charles Hunter Dunn, M.D., *President*.
Richard M. Smith, M.D., *Secretary*.